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by W. H. Dalrymple, Baton Rouge, La.

CONTENTS

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TETANUS

THERE is probably no infection to which horses are more generally exposed during the months of spring and summer. The germ-laden dirt of streets, barns and stables is a constant menace because of the many foot-injuries—cuts, bruises, nail punctures, etc.—to which the animals are subject.

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THE A. V. M. A. A MISSIONARY ORGANIZATION.

Among the various functions of the American Veterinary Medical Association, that of the missionary is by no means the least important in helping to spread the gospel of veterinary science throughout the length and breadth of the land.

There are still many benighted sections of our country that need to receive "the light," where crude ideas as to disease and cruel methods for its relief still prevail, resulting in animal life being the sufferer, and with large financial losses to live stock owners.

The "hollow-horn," "hollow-tail," and "hooks" specialists (?) are still too numerous for the general good; and the operator who places implicit confidence in certain phases of the moon is yet to be found.

In sections of the country where such superstitions still exist, the natural feeling is to adopt the "Macedonian cry" of old: "Come over and help us!"

True, there is scarcely a part of the country in which the Association is not represented by members, although few in numbers in some instances; and while these are doing valiant

pioneer work for the profession, their influence on the stock-owning public is necessarily limited to restricted areas in which they may be located. Or, to use a further quotation: "The harvest is plentiful, but the laborers are few."

There are at least two important results, in a missionary way, the writer believes, the Association, in annual convention, can accomplish in new territory. First, the encouragement of its members, and the profession generally in the section visited; and second, the production of a favorable impression upon the people by their seeing, and having in their midst, the representative body of the veterinary profession of the country. And such an impression, let it be said, the A. V. M. A. has never yet failed to leave in any of its former convention cities.

It is this missionary effort on the part of the Association that the southern section of the country has, for a long time, stood in need of, and which, we are pleased to say, is about to receive the benefit of in the very near future.

As many of the older members may recall, the only annual meeting of the Association ever held in the South was in Nashville, Tenn., in 1897, the Nashville Exposition year. The writer had occasion to remain over in the Tennessee capital for some little time after the convention, and in order to obtain an expression of opinion as to how our body, although much smaller in membership in those days, impressed the people there, asked "mine host" of the headquarters hotel, what he thought of our gathering of representative American veterinarians? His reply was that he never had any idea the veterinary profession was represented by such a splendid class of men. In fact, he added, "Your association was composed of the finest body of men who have met in convention here during the Exposition." To create such a favorable impression, and leave such a good name behind us, is surely excellent missionary work for the profession. Our conventions, especially in new territory, are needed for missionary effort of this kind. They encourage the practitioner; they stimulate enthusiasm among state associations; and they educate the public to the standing, prominence and importance of the profession as a whole.

We are looking forward to just such results accruing from our meeting in New Orleans in November; and not only to the immediate vicinity, but to the entire southern section. And as numbers are always impressive, members should begin to make their arrangements in plenty of time so that nothing may prevent

their being in attendance to help make the 56th annual the biggest and most successful convention the Association has ever held, remembering that we owe it to the profession in the south to make this a big missionary effort in its behalf.

EARTH-WORMS AND ANTHRAX.

A number of years ago Pasteur suggested that the spores of anthrax were brought to the surface, from buried infected carcasses, by earth-worms and spread upon the ground in their castings. The older textbooks carry the statement; and we find authors of recent papers on the subject of anthrax continuing the same.

For some time, however, the writer has been much inclined to doubt the absolute accuracy of the statement of the earlier investigators. In the first place, the anærobic conditions surrounding the infection in the deeply-buried carcass would tend to hasten degeneration and death of the ærobic organisms before it was likely for the earth-worms to come in contact with them, and afterwards raise them from the lower depths to be ultimately spread upon the surface in their excrement.

And further, although the depth to which this annelidian representative descends varies according to conditions of temperature and moisture, in summer it is said to be found near the surface, and in winter, just below the frost-line, and varying in depth according to the depth of that line. Isolated cases are cited by Darwin* where earth-worms have been found at a depth of seven or eight feet, which, however, must be rather exceptional, speaking generally. We would rather give credence to the opinion that the infection on the surface, which has been credited to the upward "freight-carrying ability" of the earth-worm, never had been buried at all, but had been left there through the medium of infected discharges, either rectal, nasal, or other, and overlooked in the burial.

In fact, Harrington† states that "it was thought at one time that, following the burying of animals dead with the disease, the soil could be infected thoroughly through spore formation, the spores being brought to the surface by earth-worms, there to be the cause of fresh infections. Now, however, this view is re-

* Darwin.—The Formation of Vegetable Mould Through the Action of Worms, pp. 109-110.
† Harrington.—Practical Hygiene, p. 303.

garded as untenable, since the spores are not found within the putrefying carcass, and the bacillus itself is soon destroyed in the process of decomposition of the tissues. Thus when a body is buried, the organisms are soon rendered incapable of reproduction or of continuing their own existence.

"The theory that the spores are brought to the surface by burrowing earth-worms was demolished by Koch, whose conclusions were based upon direct experiment, and was abandoned by Pasteur himself, who first suggested it, because of finding spores in the superficial layer of soil at a spot where, two years previously, a cow, dead of the disease, had been buried at a depth of two metres, a depth not ordinarily reached by earth-worms in their burrowing. Therefore, it seems most likely that fresh outbreaks among cattle grazing on fields where others have died and have been buried are due, not to the buried organisms, but to those which in one way or another, from the blood or dejecta of former cases, have been deposited on the surface."

Taking all things into consideration, therefore, the earth-worm theory seems untenable and should be abandoned in the interest of accuracy.

On the other hand, the writer is of the opinion that, if all the natural openings of the carcass are effectually closed, or plugged, with tow or lint cotton saturated with some effective germicidal fluid to prevent the escape, and destroy the infectivity, of any possible discharge, and the carcass interred, with or without lime, the chances for infection being left at that point will be extremely small. In short, if the *whole* carcass, including its infected tissues, discharges and all, is carefully buried, the risk of future infection from that source will be reduced to the minimum, and without much fear of its being brought to the surface from the bowels of the earth in the bowels of the earth-worm.

Dr. Cecil Houston has been transferred from B. A. I. work in Milwaukee to Cudahy, Wis.

The Journal is in receipt of a communication from Dr. H. L. Darby, Rio De Janeiro, Brazil, saying that the first American magazine he saw in the tropics was the March Journal of the A. V. M. A., and we venture to state that Dr. Darby read every word therein and eagerly looks forward to the coming of each number.

HORSE TYPHUS; MORBUS MACULOSUS (PURPURA HEMORRHAGICA).*

B. Frank Senseman, V. M. D.

This disease was formerly known as typhus or typhoid fever on account of its supposed identity with these diseases.

Hering called it "petechial fever" after its most important symptom, viz: that of hemorrhages in the mucous membranes; he laid particular stress on the fact that petechiæ on the mucous membranes also occur as a mere symptom in diseases, such as strangles, which have no connection with petechial fever.

In England petechial fever was regarded by some as scarlatina; by others as morbus maculosus of man *(Purpura hemorrhagica)*. The name Morbus Maculosus was commonly applied to it in Germany by Eberhard. In France and Italy it was looked upon by some authorities, and is regarded by some, even at the present time by Trasbot, as acute anasarca; and was traced, not to decomposition of the blood, but to temporary paralysis of the capillaries and effusion of serum and blood.

Lafosse and others stated that it was either septicemia or anthrax, because it is neither infectious nor can it be transferred by inoculation to horses or to other animals. Besides, the bacilli of anthrax have never been found in the blood of horses suffering from it; and some of its symptoms are incompatible with the suppuration of anthrax.

OCCURRENCE.

The disease usually occurs sporadically, but many cases have appeared in a short time, especially in stables where influenza and strangles have existed. The disease is of importance, on the one hand, because of its frequently fatal termination; and, on the other hand, by the very slow course and loss sustained by the continued disability of the patient for work.

ETIOLOGY.

Purpura hemorrhagica, with rare exceptions, develops as a secondary affection, as a sequel to diseases in which suppuration or necrosis of tissue have occurred in any part of the body; such

* Presented at 36th Annual Meeting of the Pennsylvania State Veterinary Medical Association.

diseases are especially strangles, pneumonia, pharyngitis, influenza, pyemia of the sinuses of the head, caries of bone, abscesses from any cause. All of these diseases are associated with the presence of microörganisms, and as the *Purpura hemorrhagica* sometimes occurs in the form of an enzoötic, it may be accepted that microörganisms are either directly or indirectly associated in the development of the disease.

The characteristic hemorrhages and serous exudations in disease indicate a severe affection of the vessel walls, which in all probability may be explained by the fact that chemical substances which circulate in the blood reduce the normal elasticity and resistance of the vessel walls. While this may be the result of a change in the blood, through which the nutrition of the walls of the vessel becomes diminished, and the watery consistency of the blood in itself facilitates the transudation of the blood plasma, a direct toxic action appears much more probable in consideration of the quick, sometimes very abrupt, hemorrhages and serous infiltrations.

Since, according to observations, pathogenic bacteria produce toxic substances, poison of similar origin may be suspected as the etiological factor of the disease.

According to Dickerhoff's conception, these toxins form in necrotic or suppurative lesions which develop in any part of the body through the action of the microörganisms during the course of the primary disease. This supposition is very probable, as the diseases preceding petechial fever, as a rule, are those in which the abscesses or gangrenous areas which develop in the course of the diseases communiate—either originally or later—with the outside world, whereby microöorganisms may readily gain entrance into the body. These organisms may then multiply in the exudates, or necrotic tissues, and produce chemical poisons which are later absorbed by the circulation. Accordingly, *Purpura hemorrhagica* should be considered as an infectious disease in which, however, the virus (probably the pyogenic streptococcus, which, because of its ubiquity, easily gains entrance into the necrotic tissue) exerts its pathogenic action indirectly with its specific toxic products.

SYMPTOMS.

The disease usually commences with the appearances of small punctiform or linear hemorrhages in the nasal mucous membranes. In some instances the animals do not evidence any dis-

turbed state of health, neither lose desire for food; only manifesting slight dullness and depression.

Immediately after the appearance of hemorrhages in the nasal mucous membranes, swelling of the skin and the subcutaneous connective tissue make their appearance. In some cases numerous urticaria-like vesicles develop over the entire body, which disappear after a short time or coalesce, forming larger areas of swelling. These swellings often grow rapidly, assuming great dimensions. In severe cases the circumference of the extremities becomes enormous, so much so that the legs from the elbow to the foot swell to two or three times their natural size. On the head the swelling first affects the alæ of the nose and the lips, soon the lower part of the face and then the fore part of the head; in fact, assuming the size of or resembling the appearance of a rhinoceros.

The skin over the swellings becomes stretched so that a yellow serum oozes out, which later dries and forms a crust. The swellings of the legs impair the physiological functions and mobility of the affected part of the body.

When the swelling extends to the folds of mucous membranes of the larynx, then the animal will show indications of inspiratory dyspnœa, and finally asphyxiation may result.

In severe cases disturbances of the digestive tract are noticeable, which are due to involvement of the mucous membranes of the stomach. Symptoms of colic sometimes follow the severe changes, and these indicate hemorrhages of the intestinal walls. In case of severe inflammation of the bowels profuse diarrhœa appears and may continue, causing the death of the animal.

COURSE.

The course of *Purpura hemorrhagica* varies from the very mild form causing petechiæ of the nasal mucous membranes and small swellings of the skin, urticaria-like in character and running its course in three or four days, to the extreme distortion of the body and resulting in death from asphyxiation or sepsis.

In favorable cases the swellings, after reaching a certain degree, retrogress rapidly or gradually. Sometimes, however, the improvement is only temporary and the conditions become again aggravated and in this way the disease runs a course of eight or ten weeks. After some of these necrotic areas form it requires considerable time and treatment until the normal function and appearance are restored to the animal.

TREATMENT.

Symptomatic treatment has a great influence on the further development of symptoms and on the termination of the disease, especially as you are frequently called upon to avert asphyxiation.

It is of very great importance to secure suitable food for the affected animal and plenty of fresh water with hydrochloric acid in it. If difficulty in masticating, then give green food, bran, gruels, etc. Plenty of fresh air; in fact, if a pasture can be secured for the animal, by all means do so, for when the patient can move around in the pasture and eat the grass, recovery is then very speedy.

Wounds, ulcers and abscesses require antiseptic and surgical treatment. When you have swelling of the nasal membranes the nasal cavities must be cleansed with a weak antiseptic solution two or three times daily; 2% Lugol's solution, creolin, lysol or alum, each, should be of a mild, non-irritating solution.

The superficial swellings may be bathed with spts. camphor, spts. turpentine, but I advise an unction pyroligneous acid, tr. iodine, and linseed oil. It is not as irritating as some of the watery solutions.

Internal Medication.—Potas. chlorate, tr. ferri chlor., spts. terebinth, spts. camphor, iodine, potas. bi-chromate, acid sulph., ac. hydro chl.

Tonics, and where abscesses are very pronounced, I give Donovan's solution.

SERUM TREATMENT.

Case No. 1.

Anti-streptococcus in streptococcus infection. Various authors use the serum for the treatment of *Purpura hemorrhagica* in horses, according to the prevailing idea that the disease is caused by a streptococcus infection.

The anti-streptococcus serum was used in a case of *Purpura hemorrhagica* affecting a bay mare, the sequel of a pharyngitis and which at first did not appear to be an aggravated case. The serum was used for three or four days; the edematous swellings of head, body and legs showed a very decided improvement. During this time the animal was in pasture throughout the day and stabled at night. Evidently the disease migrated to the digestive tract, causing colic, death ensuing after a few hours.

CASE No. 2.

Bay Gelding.—Acclimated horse. No primary disease affecting this animal prior to the time my attention was directed to this animal for treatment.

The swellings of the head and abdomen were among the largest that I have ever seen during my practice. The abdominal swellings were punctured freely and great quantities of serum drained from these parts, with gratifying results. The swellings of the head were treated with an ointment composed of pulv. camphor, iodine crystals, and lard. This combination I have used in other cases with best of results. Anti-streptococcus serum was used.

CASE No. 3.

Bay Gelding.—This animal not known to have any previous sickness. Upon examination of the nasal mucous membranes found extravasations of blood with dejected appearance, stiffness upon movement, in a few days swellings forming and kept getting larger, head becoming larger and post-pharyngeal swellings increasing to such an extent that dyspnœa became so pronounced that asphyxiation was threatened, and tracheotomy was performed at 2 a. m., giving immediate relief. Swellings around the ankles became enormous, so that the skin broke, forming deep fissures and sloughing. However, animal was forced out into a pasture and this was, to my mind, the best treatment, since recovery began from this date.

CASE No. 4.

Black Gelding.—Purchased in March with twenty other animals; several of these animals had shipping fever, influenza and laryngitis. This animal showed no infection whatever, was in the best physical condition, shiny coat, good flesh, looking in perfect health, suddenly became dull, and nasal mucous membranes showed extravasations of blood; head and legs becoming swollen, abdominal dropsy, sheath enormously swollen, quite a large abscess of the extensor group of muscles on the left fore leg; also abscesses on both posterior legs above the hocks between the gastrocnemius—flexor pedis perforans, flexor pedis perforatus—large amounts of necrotic tissue were discharged from both and, while the abscesses were so large the animal remained almost immobile, eating practically nothing for eight or ten days, finally cob corn was given in small quantity with the idea that probably it would help strengthen the animal, which it did, and finally

the horse began feeding and improving and after four months was again looking quite like himself. This animal was given ounce doses daily of Donovan's solution, also Elix. iron, quinine, and strychnine, half-ounce doses twice daily.

These are a few of the cases treated since I have been engaged in practice, and I desire to state that some of the cases treated were extremely severe in character, and there is no doubt in my mind that if I would not have had an opportunity of putting the animals in pasture, 40% more would have died. Where I have been favored with a pasture, I am confident that the death rate has not been 10%. The last five cases I have been called upon to treat happened during the summer and as soon as diagnosis was made the animals were turned into the pasture and all made quick and good recoveries.

OBSERVATIONS AND RESULTS OBTAINED IN TREATING CATTLE FOR STERILITY.*

BENJAMIN PRICE, West Chester, Pa.

In presenting this paper on the subject of Observations and Results Obtained in Treating Cattle for Sterility to the members of the State Veterinary Medical Association, I feel that my observations and results are both too limited to be worthy of much consideration by the profession.

However, it is not always the contents of a paper that accomplish much good, but more frequently the general discussion following which brings out the experience and results of several interested in the same line of work.

It is just such offerings and expressions of accomplishments and results when considered or combined permit us to arrive at final conclusions worthy of recognition and so valuable in obtaining improved methods and better results, not only for ourselves and our clients, but for the enlightenment and betterment of our chosen profession.

It is with the hope of producing such a discussion among you today that I have consented to submit a few of my own personal results and conclusions.

Sterility exists in alarming numbers of cows, and I think it can be safely said, has been on the increase instead of the decrease for the past few years.

* Presented at 36th Annual Meeting of the Pennsylvania State Veterinary Medical Association.

This condition of affairs is probably due to several factors, some of the most common being present stabling methods of crowding greater numbers into lesser space, combined with heavy feeding of rations containing larger quantities of concentrates which naturally overtax every internal organ. This practice, with little or no exercise, would hinder and lessen the fecundity of everything.

The chief cause or causes, however, is the increasing prevalence of granular vaginitis and abortion, a disease to which a very large percentage of the existing sterility is due.

I am satisfied that about 75% of the sterility in cows is due either directly or indirectly to the bacillus of abortion; the genital organs frequently becoming so diseased that conception is impossible for many months.

Then, too, after pregnancy exists the fœtus is expelled at such an early date and with so little apparent external manifestation that it goes by unnoticed by the herdsman and the cow is recorded as sterile.

Sterility is frequently due to the very common condition, metritis, and its sequel, pyometra, either of which have produced countless numbers of sterile cows, and it is rather annoying to think that we as practitioners were indirectly to blame for our inability in treating diseases of the uterus in a practical way after the os-uteri had partially closed.

Present-day efficiency lies principally in our ability to prevent disease rather than in our success in curing it. This applies particularly well to sterility.

It is most gratifying to feel that at the present time we have a treatment for disease of the genital organs that is undoubtedly effective in making sterile cows breeders, but, better yet, is invaluable in preventing the cows from becoming sterile.

In my remarks I have reference to the Albrecktsen treatment for sterility and abortion, a procedure of unquestionable financial benefit to both the veterinarian and dairyman, as well as being a most professional procedure in its application.

Until the introduction of this treatment, the veterinary practitioner in general pulled off more fake stunts in his almost futile treatments for sterility than in any other line of his work.

How often would he have been embarassed had the owner known how very little good was actually accomplished either by instrument or by hand in dilating the rigid os.

With this treatment, one painting of the canal with Lugol's solution of iodine will in two or three days relax an os that will hardly permit the entry of the dressing forceps to the extent of the easy passing of a catheter the size of one's finger.

After using this treatment for abortion and sterility continually—yes, I might say almost daily for the past three years—I am satisfied to make a few statements that may be of interest to some of you at least.

This treatment can very profitably be used on all cases of metritis and pyometra, no matter what the cause may be. This will save the owner many times the veterinarian's fee in placing his cow in a healthy condition in one-fourth the time, frequently avoiding prolonged and occasionally fatal cases of septicemia.

In cases of retention of the afterbirth, it is good economy from the owner's standpoint to treat every cow in from four to seven days after the removal of the membranes. No matter what the external appearances may denote, this practice, combined with the proper treatment of all cows which abort or are affected with either metritis or pyometra, will, in my judgment, prevent at least 75% of the cases of sterility among cows.

This feature alone is worth dollars to the dairy industry. No dairyman can argue that the treatment does not pay. The amount of extra milk alone which will be received by avoiding prolonged cases of septicemia will pay the doctor bill, the fewer cases of sterility and the greater advantage of being able to safely breed his cows in one-third less time, as was formerly recommended after abortion or metritis, is a great gain. This is particularly true to the breeder of pure-bred stock.

In using this treatment in a certified herd of eighty-five head during a period of three years, we have had the following results: Ten cows treated for sterility during first year all conceived except two, both of which had granular vaginitis or pyometra of long standing.

During the same year sixteen cows aborted in an interval of six weeks. All were isolated and treated. Fifteen had conceived with two or less services, one was re-treated after third failure and readily bred. During the second year it was necessary to treat three cows for sterility and three cows aborted, two of which were heifers carrying their first calves. Every cow in this herd was given the treatment prior to being bred, and it is rather remarkable that so far this season (and about one-half the cows have freshened) there has been but one dead calf and one reten-

tion of the placenta. The calves have been more vigorous and healthy and the owner is an enthusiastic booster.

In another large herd treated there were six cows which had been served regularly for a period of over one year. While treating four other cows which had gone from six to nine months, I suggested to the owner treating all the winter cows—thirty-five head—which was done.

Of the ten sterile cows, five bred after the first three treatments, the remaining five were re-treated and two bred; the other three never will breed, as they were milked out and fattened. Of the thirty-five cows treated for no cause, all carried mature calves except two—one a dystokia, the other dead-born. It is interesting to note that of the thirty-five head only two required the removal of the retained placenta.

In other large herds, where the treatment has been extensively used, the results have been most gratifying, and if time permittd we might discuss many more interesting case reports, some of successful termination and others different, but it is most gratifying to me to state that slightly over 60% of the cows treated for sterility have become breeders with the application of three treatments. Of the remaining 40% nearly 10% responded and conceived after receiving two or three more treatments.

The remaining 30%, the cause of the sterility was usually traceable to diseased conditions of the ovaries or uterus or probably some malformation of the genitals.

Regarding the application of the treatment, there is little need of an amateur occupying much of your time except that I want to state that after trying out nearly all of the available and feasible antiseptics, I am convinced that with this treatment Lugol's solution of iodine has given me the best results. It is non-poisonous, of undisputed antiseptic and germicidal value, it is in a 1% to 2% solution, just sufficiently stimulating to produce an increased blood supply to the more superficial layers of the lining membrane, and yet not sufficiently irritating to produce any inflammation or discharge.

The freshly stimulated and invigorated lining membranes are in a much more receptive condition for the fertilized ova than are those of the non-gravid uterus, which, if untouched, is always coated with a gelatinous exudate and to the eye has a most dormant, unfertile appearance.

The Albricktsen treatment applied before breeding is of marked benefit to all cows, the result being quicker and easier

conception, with fewer cases of retained placental membranes, and more vigorous calves at time of birth.

In my practice during the past season there have been fewer cases of sterility than in previous years. This I attribute to the fact that all cows which abort and which retain the afterbirth or have any pyometra are given the treatment, and by following this method I am convinced that sterility among cows can be reduced 75%, and the cows can be bred in from one to three months earlier than those not treated.

The veterinarian realizes that tuberculosis produces greater annual losses to the stock industry than any other disease, but it is hard for many farmers to see.

When from 10% to 35% of a herd abort within a year, and the half of them will not breed, it takes only a schoolboy's calculation to figure in dollars and cents the actual loss occasioned by abortion and sterility.

It is my prediction that within the next few years this treatment for these ailments will be acclaimed as great a financial asset to the dairy industry as is the present treatment for parturient-paresis.

BLACKLEG AGGRESSIN.*

HERBERT C. WARD,
Research Laboratories, Parke, Davis & Co., Detroit, Mich.

For more than a century men have known something about a disease called Blackleg. Over forty years ago the specific agent was discovered and for thirty years cattle have been successfully protected against this infectious plague. Before practical methods of immunity were discovered tremendous losses, ranging from 5% to 25%, occurred among the young stock in certain areas of world-wide distribution. Vaccines reduced these losses to 1% and even less. But to the stockowner as certainly as to the public welfare the loss of even 1% of such live stock wealth is still a most serious economic burden. Therefore we understand why men have been stimulated to improve their methods in the manufacture of an ideal vaccine. The crude vaccines of the past have rendered historical service, but today we have hope of greater efficiency in a new and better method.

* Paper read before the Southeastern Michigan Veterinary Medical Association.

Attenuated vaccines were made both from diseased tissues and from pure cultures. Their protective values were determined upon tens of thousands of cattle in the afflicted districts, as well as upon experimental animals of the laboratory. Naturally, the most successful vaccines became more and more extensively employed. But failure following applications in their use were continually suggesting the need of an improved and safer protection. Vaccines were subject, therefore, to new processes of attenuation. Animals were injected in different portions of the body, and efforts were made to improve these immunizing substances.

This effort to secure a more satisfactory vaccine has brought us to the present consideration of a group of blackleg immunizing products known as aggressins.

Inquiry as to the exact meaning of aggressin informs one that this term has been used to express a theoretical course of immunity reaction when a bacterial exudate is injected into the living body. Bail reported that exudates from infective processes produced an active immunity against the original excitant of the specific disease. His further observations led him to report that the leukocytes were inactive, being destroyed or held back by some potent force in the exudate; so that in the absence of these cells the blackleg or other bacilli were able to rapidly multiply and complete for that animal the course of a natural infection. According to his opinion, then, this potent force in bacterial exudate is active, offensive, destroying somewhat the resident defenses of the body. This action is due to some toxic substance produced by the blackleg organism as it develops in the tissues during infection. Because these exudates possess this aggressive power they have been popularly termed aggressins.

Let us take, therefore, a small amount of the exudate from the muscle of a bovine dead of blackleg in the field and inject this into a healthy animal. What happens? The aggressin clears the way for a free, unrestrained development of the blackleg organism and the animal sinks before the onslaught of an acute infection.

When we remove the living virus, filtering out the spores and bacilli from this exudate, no such infection develops, no local or general reaction occurs. Therefore if toxic principles are produced, they exist only in physiological proportions. Exposing a treated animal later to blackleg virus no infection follows in the presence of an active immunity. For a short and rather indefinite period following treatment with this germ-free exudate, or

aggressin, calves become highly sensitive to blackleg infection, and if exposed to a natural infection or to experimental virus will die as though untreated. This hypersensitive condition passes away in a few days and it is then practically impossible to produce blackleg with even a double dose of experimental virus.

Repeated demonstration of the practical truth of these results underlies our success in immunizing susceptible animals with blackleg aggressin.

Aggressins were first used experimentally on laboratory animals by Bail and were obtained by pipetting off the peritoneal exudate from his infected animals. Schobl, acting on Bail's suggestive work, first experimented with blackleg aggressin on guinea pigs. To secure his exudates he injected guinea pigs subcutaneously and at the climax of the infection withdrew the tissue juice, centrifuged it, and shook with toluol. The clear liquid was then tested free of bacteria. This immunized guinea pigs against a virus successfully after a ten-day period.

For large amounts of aggressin he injected a calf with blackleg tissue virus and obtained the edematous extract. This was then centrifuged clear and preserved with toluol. After filtration through Berkefeld it was proved to be germ-free by both cultural and animal tests.

More recently R. A. Kelser reported his method of manufacturing blackleg aggressin. Animals received muscle virus intramuscularly and following death the edematous fluid and affected muscle tissues were collected, mixed, and ground up. This mixture was then frozen and left for a few hours, after which thawing was facilitated and the filtrate obtained by pressing and filtering. His product was found to possess the same immunizing properties as discovered by Schobl.

The commercial processes of manufacturing wholesale amounts of blackleg aggressin vary only in mechanical details. Susceptible animals are subjected to fatal artificial infection with muscle virus or cultures. A few hours after death the hair and hide is removed, the edematous juices collected and the affected muscle tissues excised and pressed until all the liquid has been obtained. This is filtered and preserved until free of all viable cells and spores. After double testing by sterility and safety trials this filtrate is delivered to the market as germ-free blackleg aggressin.

When we seek for a demonstration of the protective value of blackleg aggressin it can be found in the report of Schobl, who used successfully both guinea pigs and calves. His results are quoted in the following Table No. 1.

TABLE No. 1.

AGGRESSIN IMMUNITY TESTS BY O. SCHOBL

Animal Groups	*Aggressin*	*Time Before*	*Infection With*	*Results*	
Guinea Pigs No. 1	0.5 mil.	0	B. S.	.....	Died
2	0.5. mil.	0	"	.....	"
" 1	1.0 mil.	2 days	Exudate	.....	Died
2	1.0 mil.	"	"	.....	"
3	0	"	"	.....	"
4	0	"	"	.....	"
" 1	1.0 mil.	4 days	Exudate	Lived	.....
2	1.0 mil.	"	"	"	.....
3	0	"	"	.....	Died
4	0	"	"	.....	"
" 1	0.5 mil.	6 days	Meat	Lived	.....
2	0.5 mil.	"	"	"	.....
3	0.5 mil.	"	"	"	.....
4	0	"	"	.....	Died
5	0	"	"	.....	"
" 1	0.5 mil.	10 days	Exudate	Lived	.....
2	0.5 mil.	"	"	"	.....
3	0	"	"	.....	Died
4	0	"	"	.....	"
" 1	0.5 mil.	21 days	Meat	Lived	.....
2	0.5 mil.	"	"	"	.....
3	0	"	"	.....	Died
4	0	"	"	.....	"
" 1	1.5 mil.	51 days	Meat	Lived	.....
2	0	"	"	.....	Died
3	0	"	"	.....	"
Heifers No. 4	5.0 mil.	10 weeks	Meat Virus	Lived	.....
5	7.0 mil.	2 weeks	"	"	.....
6	0	.....	"	.....	*

*Died from acute infection.

His study showed that animals were not protected immediately following aggressin injection. After three days a developmental immunity was established and remained active as long as the tests were continued.

Kelser failed to demonstrate satisfactorily immunity values when he used guinea pigs, but his results with calves were excellent, and are quoted in the following table.

TABLE No. 2.

Animal	*Aggressin*	*Time Before*	*Infection With*	*Results*	
Calf No. 1	5 mils	14 days	Muscle virus	Lived	.....
2	5 mils	"	"	"	.....
3	0	"	"	.....	Died
4	0	"	"	.....	"
5	0	"	"	.....	"
6	0	"	"	.....	"
1	5 mils	5½ months	Muscle virus	Lived	.....
2	5 mils	"	"	"	.....
3	0	"	"	.....	Died
4	0	"	"	.....	"
5	0	"	"	.....	"
6	0	"	"	.....	"

These findings indicate perfect protection and permanency of the acquired immunity. It is important to call attention to the fact that the treated animals were not infected until after a period of fourteen days.

With the suggestive results already reported in mind, we applied the same kind of tests upon blackleg aggressin as it is being placed on the market today. The following tables represent the results of our experimental studies.

TABLE No. 3.

Animal	*Dosage*	*Time Before*	*Infection With*	*Results*	
Guinea Pig 1	1. mil.	1 day	Muscle virus No. 4	Lived	.....
2	1. mil.	"	"	.....	Died
3	Control	"	"	.....	"
" 1	1 mil.	2 days	"	Lived	.....
2	1 mil.	"	"	.....	Died
3	Control	"	"	.....	"
" 1	1 mil.	3 days	"	Lived	.....
2	1 mil.	"	"	"	.....
3	Control	"	"	.....	Died
" 1	1 mil.	4 days	"	Lived	.....
2	1 mil.	"	"	"	.....
3	Control	"	"	.....	Died
" 1	1 mil.	6 days	"	Lived	.....
2	1 mil.	"	"	"	.....
3	Control	"	"	.....	Died
" 1	1 mil.	7 days	"	Lived	.....
2*	1 mil.	"	"	"	.....
3	Control	"	"	.....	Died
" 1	1 mil.	8 days	"	Lived	.....
2*	1 mil.	"	"	"	.....
3	Control	"	"	.....	Died
" 1	1 mil.	10 days	"	Lived	.....
2	1 mil.	"	"	.....	Died
3	Control	"	"	.....	"
" 1*	1 mil.	12 days	M. virus also culture	Lived	.....
2*	1 mil.	"	"	"	.....
3	Control	"	"	.....	Died

A few animals died from mixed infections and in all such sets* duplicate trials were made with satisfactory results. Careful checks were made of every animal dying under tests. The above results constitute, therefore, a demonstration of the protective value of blackleg aggressin against blackleg experimentally produced in guinea pigs. This protection did not appear to have developed until the third day.

Before proceeding to the test on bovines it was necessary to gauge as near as possible the cultural virus and in order to demonstrate viable pathogens in the culture virus recourse was made by subjecting guinea pigs to graded doses. The results of such a titration are to be seen in Table 4. All animals were posted and the purity of the virus established microscopically and culturally.

TABLE NO. 4.

VIRUS NO. 7 TITRATION.

Animal No. 1	Rec. Subc.	1.0 mil	Virus No. 7	Dead in 18 hours
Animal No. 2	Rec. Subc.	0.5 mil	Virus No. 7	Dead in 18 hours
Animal No. 3	Rec. Subc.	0.2 mil	Virus No. 7	Dead in 18 hours
Animal No. 4	Rec. Subc.	0.1 mil	Virus No. 7	Dead in 18 hours

VIRUS NO. 3 TITRATION.

Animal No. 1	Rec. Subc.	1.0 mil	Virus No. 3	Dead in 16 hours
Animal No. 2	Rec. Subc.	0.5 mil	Virus No. 3	Dead in 16 hours
Animal No. 3	Rec. Subc.	0.1 mil	Virus No. 3	Dead in 32 hours
Animal No. 4	Rec. Subc.	0.05 mil	Virus No. 3	Dead in 38 hours
Animal No. 5	Rec. Subc.	0.01 mil	Virus No. 3	Sick (?)
Animal No. 6	Rec. Subc.	0.01 mil	Virus No. 3	Sick (?)

Both strains of the blackleg virus were active, therefore, in doses of 0.1 mil or less for guinea pigs.

Such a titration was used as a guide by which the dosage for bovines could be determined. The final dosage was set at 5 mils and used as stated in the following tables. Virus No. 7 was used on the first three heifers, Table No. 5, and Virus No. 3 on the last three, Table No. 6.

TABLE NO. 5.

AGGRESSIN IMMUNITY TESTS ON BOVINES.

Heifer	*Immunized*	*Method*	*Aggressin*	*Inoculated*	*Method*	*Virus*	*Result*
No. 1...	2-5-19	Subc.	10.0	2-19-19	Subc.	5.0	Lived
No. 2...	"	"	5.0	"	"	5.0	Died
No. 3...	"	"	0.0	"	"	5.0	"

Heifer No. 1.—No reaction local or general.
Alive and in good condition, April 1st.

Heifer No. 2.—After 24 hours temp. normal, but local swelling.
After 36 hr. temp. subnormal, swelling developing.
Dead in 40 hours. P. M. Typical Blackleg.

Heifer No. 3.—In 24 hours temperature was 104.4 and quarter badly swollen, animal down. Dead 30 hours. P. M. Typical Blackleg.

The aggressin injections were made subcutaneously in front of the shoulder. Virus injections were made subcutaneously in the right leg.

TABLE NO. 6.

AGGRESSIN IMMUNITY TESTS ON BOVINES.

Heifer	*Immunized*	*Method*	*Aggressin*	*Inoculated*	*Method*	*Virus*	*Result*
No. 4...	2-5-19	Subc.	10.0	3-8-19	Subc.	4.0	Lived
No. 5...	"	"	5.0	"	"	4.0	Died
No. 6...	"	"	0.0	"	"	0.0	"

Heifer No. 4.—No reaction local or general.
Alive and in good condition April 1st.
Heifer No. 5.—After 24 hours, temperature normal, but local swelling
After 36 hours, temperature normal, but quarter swelling.
Dead in 40 hours. Post mortem—typical blackleg.
Heifer No. 6.—After 18 hours, temperature subnormal, swelling extensive.
Dead in 24 hours. Post mortem—typical blackleg.

The results thus obtained from the most recent experiments show clearly the protective value of aggressin against highly active blackleg virus. The virus dose proved to be altogether too high in spite of the attempt to gauge its virulence. There was no question but that the low aggressin animals possessed a positive degree of immunity. Careful post-mortem studies demonstrated that the infection was much less extensive as compared with the control infection, amounting to about one-fourth that of the unprotected animal. In addition, cultures were obtained from every portion of the body in the normal heifers, but only from the original site of injection in the aggressin heifers. Likewise, the controls all died early and symptoms were more typical. In view of the consistency of the clinical, cultural and pathological pictures, the conviction is firmly accepted that a lethal dosage would have demonstrated perfect immunity in all grades of protected animals.

Encouraging reports are rapidly accumulating in the practical field, giving to the experimental studies a new meaning and stimulating research effort like mental aggressins—making way for success.

THE BLOOD PRESSURE OF THE HORSE.

SAMUEL SCHILLING,
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The determination of the blood pressure is a valuable adjunct in diagnosis in the practice of human medicine. This usually is accomplished by the application of a sphygmonanometer to the upper arm of the patient and requires but a moment. No use has been made in veterinary practice of this index to a patient's condition, therefore it appeared that this might be a fruitful field for investigation.

It was found that by applying the sphygmomanometer to the tail of the horse, mule or ox readings of the blood pressure in the caudal arteries could be taken. The work here presented is confined to the horse, however. The first problem presenting itself was the determination of the normal blood pressure. To this

end 130 horses of all ages, both sexes, of various weights and states of condition as to flesh were examined. Full descriptive records were kept of each case, together with a record of rates of pulse and respiration and the temperature. The data was then subdivided in a suitable manner, analysis made, and averages deducted, the methods and results of which are herein reported. In later work it will be attempted to show the modifications of blood pressure that occur in various pathological conditions.

TAKING THE BLOOD PRESSURE.

The sphygmomanometer consists of a soft rubber bag covered by a band of silk which constitutes what is called a cuff; a rubber bulb for inflating the bag; and a pressure gauge. The gauge is constructed to register pressure corresponding in terms of millimeters to the heights of the column of mercury which the given pressure would support or counterbalance. In taking the blood pressure of a horse the cuff is wrapped on to the lower extremity of the upper third of the tail. This point is chosen as being most convenient and yielding the best results. If the cuff be placed too high it tends to slip down and there is apt to be interference by pressure on the buttocks; if placed too low the readings are erratic. This matter is discussed further in the section

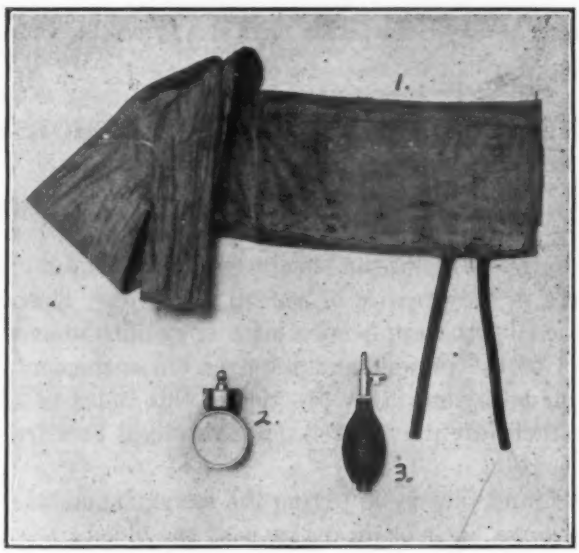


FIGURE I.
The Sphygmomanometer.
1. The cuff. 2. Gauge, or manometer. 3. Bulb.

on variations and errors. The bulb and gauge are then attached to the cuff by rubber tubing which communicate with the interior of the soft rubber bag. The cuff is now inflated until sufficient compression of the caudal arteries is effected so that visible fluctuations of the dial hand of the pressure gauge or manometer occur at each pulse beat. A reading of the manometer is made under these conditions and this is taken to indicate the diastolic pressure. The cuff is now inflated until pressure upon the caudal arteries is just sufficient to shut out the pulse wave completely, so that no movements of the dial hand occur.

FIGURE II.
Taking the Blood Pressure.

A reading of the pressure at this point is also made and it is taken to indicate the systolic pressure. In practice, in taking the pressure the cuff is inflated somewhat above the true diastolic or systolic levels and then some of the air is gradually permitted

to escape until a delicate adjustment is reached. The diastolic pressure is subtracted from the systolic and the difference is regarded as the pulse pressure.

THE MECHANICS OF ARTERIAL BLOOD PRESSURE.

A brief review of certain facts pertaining to the mechanics of the physiology of circulation may be in order so that we have clearly in mind the factors by whose operation blood pressure is produced and maintained. The application of the terms diastolic and systolic to the blood pressure will also be reviewed. We shall not enter into a discussion of the nervous mechanism which controls and regulates the level of pressure maintained; the reader is referred to text-books on physiology for a discussion of this point.[1] We may also exclude a consideration of the venous system, for it is only the arterial blood pressure that we are interested in at this time. The functioning of the heart, arteries, arterioles, and capillaries in their relation to blood pressure is therefore the point at hand.

The arteries comprise a set of elastic and contractile tubes; during life they are always moderately distended by the blood contained in them. At each pulsation of the heart more blood is forced into the arteries, which tends to increase the amount of blood contained, to distend the vessels still further; thus increasing the internal pressure. Thus all other factors remaining constant an increase in the output of blood from the heart will cause a rise in blood pressure. This increase may be caused in two ways: (1) An increase in the rate of heart beat. (2) An increase in the force of heart beat. The influence of an increase in the rate is readily apparent. In considering the effect of an increase in the force, it should be borne in mind that the ventricle does not necessarily empty itself completely at each pulsation; the degree to which it does empty itself is dependent upon the force of the contractions of the heart muscle. Thus rapid, forcible contractions of the heart increase the output of blood and tend to increase the blood pressure. Conversely slow, feeble heart action lessens the output and tends to decrease the blood pressure in the arterial system.

The blood constantly escapes from the arterial system by way of the arterioles, which lead to the capillaries. The arterioles are relatively small in diameter and offer resistance to the free escape of blood by virtue of the friction which is induced by the flow of blood through them. Were this factor of friction absent

the arteries would discharge at each beat of the heart a quantity of blood equal to that which they receive. However, due to this peripheral resistance, all the blood that enters the aorta at systole of the ventricle does not immediately escape; it is dammed back into the arteries and dilates them, increasing the blood pressure. During diastole and pause of the heart the elastic rebound of the artery walls continues to force the blood on, the arteries partially empty themselves and the blood pressure falls. The calibre of the arterioles is controlled by the vasamotor nerves. When these vessels are constricted they offer more resistance to the flow of blood through them as friction is increased; thus more blood is held back in the arterial system and the blood pressure rises.

On the other hand, if they be dilated there is less peripheral resistance, the arteries more completely empty themselves during diastole and the period of pause and the blood pressure falls.

It will be seen from the foregoing that the blood pressure varies for the individual at each beat of the heart. The high level of pressure reached during systole of the heart is termed the systolic pressure. The low pressure found during diastole and pause is termed the diastolic pressure. The difference between the two is the pulse pressure; the greater the difference, therefore, the higher the pulse pressure. The pulse pressure then is a measure of the force of the elastic rebound of the arteries available for the propulsion of the blood while the heart is at diastole and pause. It tends to be high when there is a low peripheral resistance or a forceful heart beat. Under these conditions the arteries most completely empty themselves between heart beats or again are most markedly distended by the inrush of a large quantity of blood at each pulsation of that organ. Low pulse pressure will be found in those cases where there is a high peripheral resistance or a feeble heart beat. This follows from the fact that under these conditions the blood pressure remains relatively high during diastole and pause or is but slightly augmented at systole; the difference between diastolic and systolic pressure thus is small and the pulse pressure is low.

There is still some difference of opinion as to whether the use of the sphygmomanometer gives the true diastolic and systolic values. Brooks and Luckhart[2] have shown quite conclusively by means of models that simulate the conditions found in the body that the values so obtained are above the true pressure. This, however, is not a serious matter, since we are merely interested

in obtaining the normal mean as indicated by the method employed. If the same method is then applied in clinical cases variations from the normal will be just as apparent if the readings taken give relative values as if the absolute pressures were determined.

SOURCES OF VARIATION AND ERROR.

Certain unavoidable sources of variation and error in taking the blood pressure readings are pertinent.

(1) The values secured vary with the position of the cuff on the tail. The higher up the cuff is placed the higher the systolic and the lower the diastolic values obtained. Attention is here called to Table I, which shows the values obtained by shifting the position of the cuff. The blood pressure was taken of five different animals; first the cuff was placed on the root of the tail against the body, then in the middle of that structure and also on its inferior extremity. Readings were taken in each position. It is seen that when the cuff was placed on the root of the tail lower systolic and higher diastolic values were obtained than were found at the middle of the tail in the same animal. When the cuff was placed on the lower extremity no fluctuations of the dial hand of the gauge occurred at any pressure; thus no readings could be taken.

TABLE I.

BLOOD PRESSURE AT DIFFERENT LEVELS OF TAIL.

DIASTOLIC PRESSURE.

Case No.	At Root	At Middle	At End
1	20	32	No readings
2	16	46	No readings
3	24	50	No readings
4	32	78	No readings
5	26	80	No readings

SYSTOLIC PRESSURE.

Case No.	At Root	At Middle	At End
1	132	90	No readings
2	124	98	No readings
3	114	98	No readings
4	134	98	No readings
5	164	130	No readings

This factor of variation is more serious in the equine than in the human subject because the caudal arteries narrow more abruptly and come to the terminal arterioles more quickly than the brachial when the regions at which the pressures are taken are compared. In securing the data herein presented the cuff was placed as uniformly as possible on the lower end of the upper third of the tail. In compiling the statistics and making analyses to determine the influence of age, weight, condition and sex, records of which did not appear to be representative, *i. e.*, those that had the characteristics of improper placing of the cuff were omitted.

It appears, however, that in practice this need not be a serious source of error if the clinician keeps in mind the manner in which the position of the cuff affects the pressure readings. Thus allowance can be made and a proper interpretation applied.

(2) The gauge probably does not respond equally delicately to slight impulses at all times. This is true generally of any delicate mechanism. A slight amount of inertia and friction must be overcome at each pulsation of the arteries to produce fluctuations of the hand on the dial. Each instrument would probably also have its own level of accuracy in this respect. However, an analysis of the blood pressure herein reported shows that the normal pressure probably may vary to the extent of 10 mm. Hg.; thus an error in reading of 2 to 4 degrees too high is not highly material from a clinical standpoint.

(3) The same person will at times make closer readings than at others. This is the individual personal factor. It is well known that we are not at all times equally patient and observant. Fluctuations on the gauge when extremely minute that sometimes would be recorded are at other times overlooked. Conditions of light and of the control of the patient are important in their influence on this factor. The seriousness of this source of error lies within the control of the clinician and should on practice be minimized.

(4) Likewise no two persons would probably obtain exactly the same reading for a given patient. Still the difference should not exceed 2 to 4 degrees, which is well within the limits of normal variations of the pressure.

(5) The eye alone is the guide in obtaining readings. In taking the blood pressure of the human the finger of the clinician is laid upon the radial artery at the wrist or the stethoscope is applied at that point and by the feel of the pulse wave or by

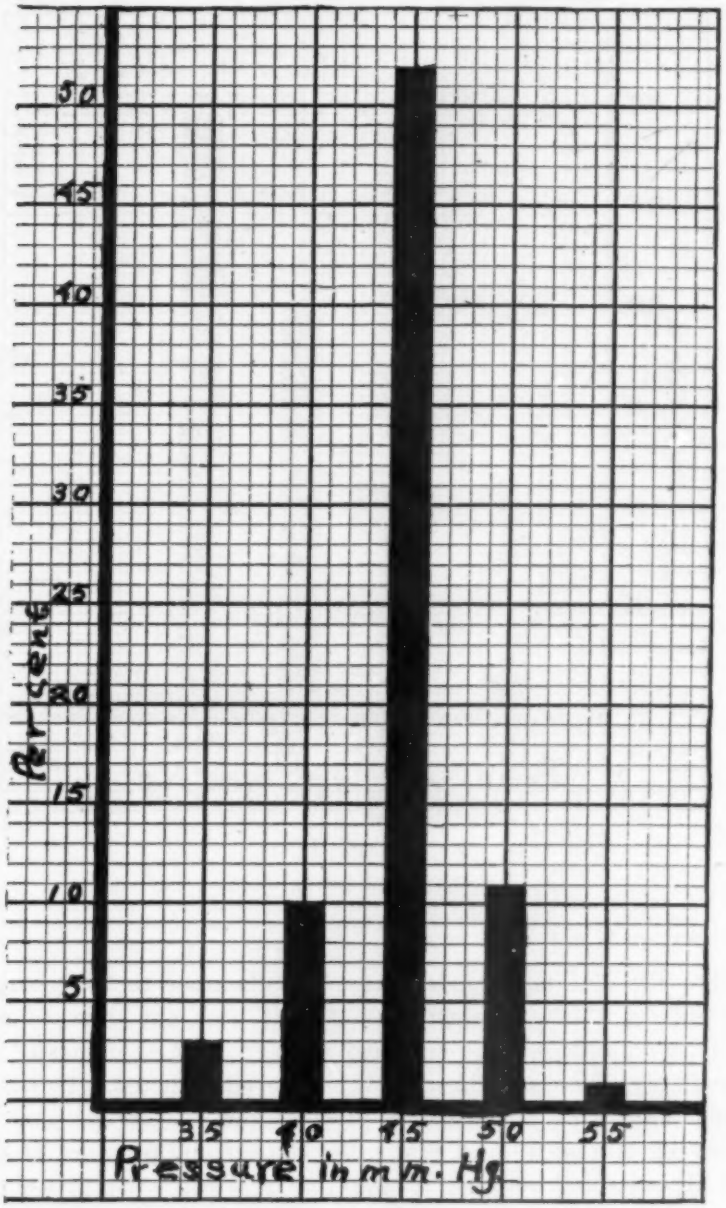
certain modifications of sound[3] as the pressure in the cuff is adjusted a means is at hand to check up on the values indicated by the gauge. In the horse, however, the pulse below the upper third of the tail cannot be felt, nor can sounds of arterial sources be heard that are of any value as a guide; the arteries lie too deeply and are too small.

(6) The patient, if nervous, will undergo changes in arterial pressure due to reflex stimulation while being examined. Excitement tends to cause an increase in blood pressure, probably chiefly due to the increased rate of heart beat that it induces. It is important that the clinician be also a good observer of the psychic reaction of the patient to being handled. Horses which forcibly depress the tail or make switching movements, step about restlessly, feint to kick, lay back their ears and bite at the stall do not yield reliable readings. The writer, however, had difficulty with only four or five animals out of 130 examined. The great majority of horses offer no resistance and remain quiescent if properly approached.

THE MEAN NORMAL BLOOD PRESSURE.

The deduction of the normal blood pressure of a species of animals depends upon obtaining readings on a number of normal animals and thereby establishing a mean. Two questions arise in each case considered: (1) Is this a normal animal? (2) Will this animal yield data suitable to apply in establishing a mean? The former question relates to the health of the animal, the latter to its excitability. Accordingly it was considered important to keep a record of each case examined as to: rate of pulse and respirations, temperature, physical condition, condition as to flesh, age, sex and weight. This data was later found very useful in making an analysis of the results.

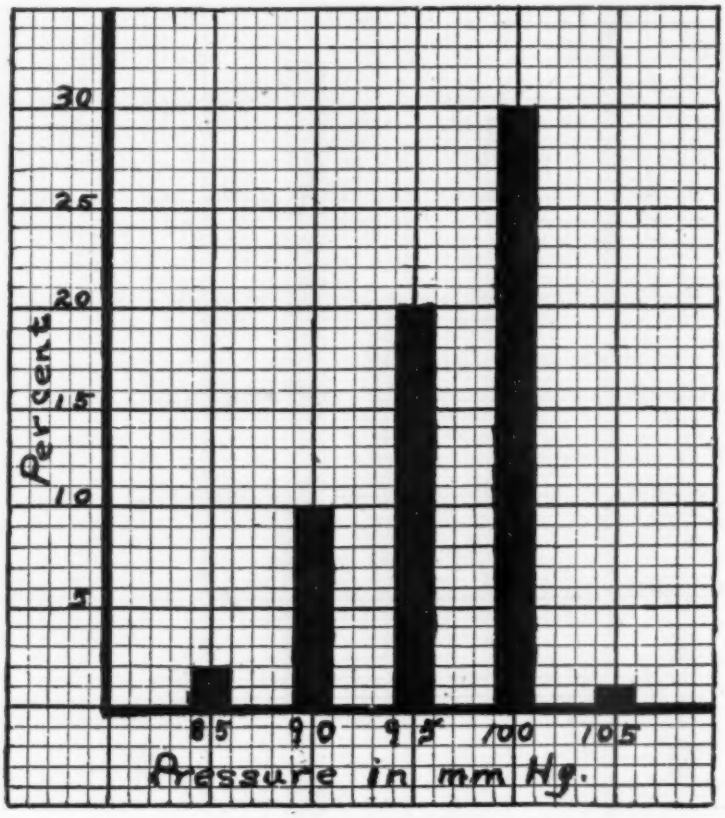
It was thought desirable first to determine the normal mean for all animals regardless of age, sex or condition of flesh. Only such animals as showed clinical symptoms of disease, temperature over 101.5 F. or abnormal rate of pulse and respirations were excluded. The maximum rate of pulse was taken as 46 for adults, 56 for 2 to 4 year olds, and 72 for 1 year old colts. Of the 130 animals examined only 100 were found to be normal according to these criteria. To merely compute the arithmetic mean of blood pressure from the records was not thought to be nearly as instructive as to construct a chart which would show between what levels the blood pressure of the majority of cases



GRAPH I.

DIASTOLIC PRESSURE.

The above is a reproduction of the significant part of the graph on diastolic pressure. Values are considered in round numbers, being reduced to the nearest figure ending in 0 or 5. Sventy-three percent of all cases are seen to fall 40 to 50 mm. pressure.

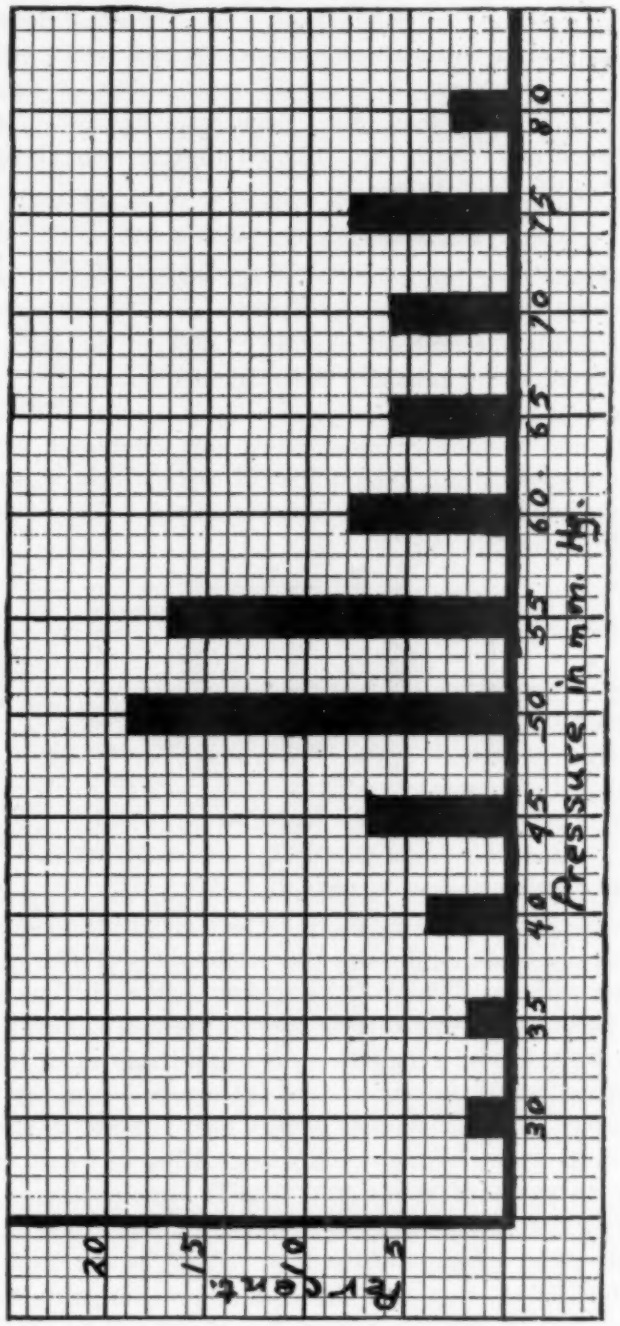


GRAPH II.

SYSTOLIC PRESSURE.

The significant part of the graph on systolic pressure. Values also reduced to nearest figure ending in 0 or 5. Sixty-nine percent of all cases are seen to fall between 90 to 100 mm. pressure.

falls; the arithmetic mean may be influenced to too great an extent by a few atypical cases and it does not show to what extent animals may be expected to vary from that mean. Accordingly, Charts I, II, and III were constructed. It will be seen that: (1) The diastolic pressure for 73% of all cases fell between 40 and 50 mm. Hg. (2) The systolic pressure of 69% of all cases fell between 90 and 100; and the pulse pressure of 66% was 40 to 70. Such a large preponderance of cases between these fairly narrow limits is rather indicative that they represent approximately the true values. If we had been able to exclude all physically or psychically abnormal animals and completely control all sources of error the percentages within these limits undoubtedly would have been much higher still.



GRAPH III.

PULSE PRESSURE.

Significant part of the graph on pulse pressures. Values are given in nearest figure ending in 0 or 5. Sixty-six percent of all cases fall between 40 to 70 mm. pressure.

In the remainder of the analyses it was therefore thought advisable to exclude from consideration all cases which presented either a diastolic pressure below 35 or above 55, or a pressure systolic below 85 or above 105 Such cases were suspected not to be in normal health even though they presented no other clinical evidences of disease.

THE INFLUENCE OF AGE.

In determining the influence of age on the blood pressure it was thought best to group the animals as: 1 year olds, colts; 2-4 year olds, adolescent animals; 5-11 years old, mature animals; and 12 or older, old animals. A sufficient number of colts below one year was not available to yield reliable results. The average diastolic and systolic pressure were now computed by taking the arithmetical mean; the number of cases within a group was found too small to apply the former method. The results were found to be as follows:

TABLE II.

EFFECT OF AGE ON BLOOD PRESSURE.

Age	Diastolic Pressure	Systolic Pressure	Number of Cases
1	44.8	105.1	6
2-4	43.4	99.9	22
5-11	42.1	102.5	54
12 or over	44.6	107.0	8

Very little variation in the diastolic pressure is seen. The systolic pressure, however, seems to be high in the young colt, is lower during adolescence and the prime years of life and again increases with age. This is in strict correlation with the behavior of the pulse rate at the various ages. It is well known by horsemen that the age of a horse from the standpoint of utility which is governed by his general health is determined more by the previous usage, care and diseases he may have suffered from at some time or other than by his actual years. Thus we would expect to find in the group of horses from 5 to 11 some prematurely aged animals which would bring the average for the group up higher than the true, representative level. That is the probable explanation for the fact that the average systolic pressure of animals between 5 and 11 is higher than that for those from 2 to 4.

THE INFLUENCE OF CONDITION AND WEIGHT.

Following similar means as employed in the determination of the influence of age, it was attempted to correlate condition as to flesh and blood pressure. Animals were arbitrarily classed as (1) poor, meaning those that were so devoid of adipose tissue as to appear bony and present figures showing some degree of emaciation; (2) fair, meaning those that showed no emaciation but appeared wiry and muscular; (3) good, which included those with rounded contours, giving indication of some padding of subcutaneous and intramuscular tissue with fat. The results are tabulated below.

TABLE III.

EFFECT OF CONDITION ON BLOOD PRESSURE.

Condition	Diastolic Pressure	Systolic Pressure	Number of Cases
Poor	40.6	98.2	10
Fair	43.2	105.5	36
Good	42.9	98.2	43

No satisfactory explanation appeared when these figures were taken by themselves, for they represented animals of all ages. When, however, a subsequent analysis was made in which only animals 5 to 11 years of age were considered and these were subdivided into horses in good condition above and below 1,300 pounds in weight and animals in poor to fair condition above and below 1,300 a rational explanation became apparent.

EFFECT OF WEIGHT AND CONDITION ON THE BLOOD PRESSURE OF HORSES 5 TO 11 YEARS OF AGE.

Below 1,300 Pounds.

Condition	Diastolic Pressure	Systolic Pressure	Number of Cases
Poor to Fair	43.1	106.5	29
Good	42.6	96.0	10

Above 1,300 Pounds.

Condition	Diastolic Pressure	Systolic Pressure	Number of Cases
Poor to Fair	*	*	*
Good	42.1	96.1	17

* Only one case.

It is seen that the factor of weight probably has little if any influence on the blood pressure of the horse as indicated by the groups of horses in good condition of flesh. The animals in poor to fair condition, however, show a higher systolic average than the corresponding group in good condition. On further search it was found that of the 27 animals in good condition only 5 showed a variation in either diastolic or systolic pressure greater than 10 mm. Hg. from the average of 40 to 50 mm. Hg. at diastole and 90 to 100 at systole. On the other hand, of the 29 cases in poor to fair condition 15 showed a greater variation than 10 degrees in either the diastolic or systolic pressure; of those in poor condition 5 out of 7 and of those in fair condition 10 out of 22 presented such marked variation. This probably means that among the animals in poor to fair condition we have a greater percentage of abnormal cases; that would account for the higher average of systolic pressures found in this group. Incidentally it is an indication that perhaps the blood pressure of the horse is greatly influenced by the health of the animal; later investigations may show that the determination of the blood pressure can be used as an aid in recognizing and diagnosing pathological conditions. It also shows that the diastolic pressure remains more constant even in cases of disease.

When we exclude all abnormal cases above referred to from both groups of horses we obtain results as follows:

TABLE IV.

EFFECT OF CONDITION ON BLOOD PRESSURE OF HORSES 5 TO 11 YEARS.

Condition	Diastolic Pressure	Systolic Pressure	Number of Cases
Poor to Fair	42.7	96.0	15
Good	42.2	95.7	22

Thus it would appear established neither that the condition of flesh *per se* nor the weight of the animal when uncomplicated by pathological conditions is an important factor in influencing the blood pressure of the horse.

THE INFLUENCE OF SEX ON THE BLOOD PRESSURE.

The probability that the condition of flesh is of slight importance as affecting the blood pressure is further brought out in the analysis to determine the influence of sex. In this case all

the mature animals were subdivided as to sex and condition. Again cases showing variations more than 10 mm. Hg. from the average limits were excluded. The averages found are here given:

TABLE V.

EFFECT OF SEX ON BLOOD PRESSURE.

Poor to Fair.

Sex	Diastolic Pressure	Systolic Pressure	Number of Cases
Male	44.0	93.3	6
Female	43.7	97.7	9

Good.

Sex	Diastolic Pressure	Systolic Pressure	Number of Cases
Male	43.5	94.7	11
Female	43.1	95.3	9

Grand Average.

Sex	Diastolic Pressure	Systolic Pressure	Number of Cases
Male	43.7	94.2	17
Female	43.4	97.1	18

The systolic pressure of females appears slightly higher, yet the difference is so small as not to warrant drawing positive conclusions. Yet should subsequent work substantiate the results here presented it would be wholly in accordance with the established fact that the systolic pressure of women tends to be higher than that of men.

A further point of interest is that of six pregnant mares examined five fell within the normal limits; the sixth presented a low—26 mm. Hg.—diastolic pressure. Pregnacy probably has little effect on the blood pressure, though the number of cases examined is too small to draw definite conclusions from.

CONCLUSIONS.

(1) The ordinary type of sphygmomanometer as used in human practice is applicable in taking the blood pressure of the horse, mule and ox.

(2) The normal diastolic pressure for the horse is from 40 to 50 mm. Hg. The normal systolic pressure is from 90 to 100.

(3) The systolic pressure is subject to the widest variation; the diastolic pressure is more constant.

(4) The systolic pressure is higher in the colt than in mature animals. An increase in blood pressure is common in old age.

(5) Females have a slightly higher systolic pressure than males.

(6) Weight and condition as to flesh seem not to have any noticeable influence upon the blood pressure.

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Acknowledgment is made to the coöperation of Drs. V. V. Brumley and J. U. Schoemaker, who were of aid in placing much clinical material at the writer's disposal.

STUDIES ON ANTHELMINTICS.

I. EXPERIMENTS WITH REPEATED DOSES OF OIL OF CHENOPODIUM.

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The superiority of oil of chenopodium as an ascaricide to other ascaricidal anthelmintics, when suitable doses of the involved drugs are compared, has been experimentally established for the dog by the work of Hall and Foster in the Bureau of Animal Industry, and of Hall in this laboratory, for swine by Hall and Foster (most of the work on swine was done by Foster),

*Resigned March 27, 1919.

and has been clinically established in the case of man by numerous observations of physicians here and in the tropics. In the case of the ascarid of the horse, Hall, Wilson and Wigdor found chenopodium superior to most of the drugs commonly used, and work by Hall, Smead and Wolf, to be published in a paper in this series, shows carbon bisulphid superior to chenopodium.

The therapeutic dose of oil of chenopodium for removing ascarids from dogs has been found by the writer to be 0.1 m. p. k. (mil per kilo). In this dosage, experiments on dogs indicate that it is inferior to choloroform in single therapeutic dose of 0.2-0.3 m. p. k. in removing hookworms. In human medicine, it has been found necessary to give chenopodium in repeated doses, usually at hour intervals, in order to remove hookworms, and even under such conditions, several treatments are not infrequently necessary. To determine the method in which chenopodium could be successfully employed against the hookworm in the dog and to secure further data as to the anthelmintic action of this drug, the following experiments were performed:

Chenopodium in Doses Repeated Over a Number of Days.

Dog No. 153, weighing 16 kilos, was given 2 minims of chenopodium in 1 dram of castor oil daily for a total of 12 treatments in 13 days. The dog had distemper and died 2 days after the last treatment. No worms were passed. There were 7 whipworms postmortem. Treatment was therefore 0 percent effective against whipworms.

Dog No. 158, weighing 16 kilos, was given the same treatment daily for a total of 17 treatments in 20 days, and killed the day after the last treatment. The dog passed no worms and had 6 whipworms postmortem. Efficacy against whipworms, 0 percent.

Dog No. 152, weighing 12 kilos, was given the same treatment daily for a total of 18 treatments in 20 days, and killed 3 days after the last treatment. The dog passed 1 hookworm on the twelfth day after beginning treatment. It had 14 *Dipylidium* postmortem. Efficacy against hookworms, 100 per cent; against *Dipylidium*, 0 per cent.

Dog No. 154, weighing 15 kilos, was given the same treatment for a total of 18 treatments in 20 days, and killed 3 days after the last treatment. Through the 8 days after the first treatment, the dog passed a total of 8 hookworms and none thereafter. Postmortem it had 7 hookworms and 41 *Dipylidium*. Efficacy against hookworms, 53 per cent; against *Dipylidium*, 0 percent. It is

remarkable that over half of the hookworms should yield to 7 treatments and the remainder resist a total of 18 treatments, but this is in keeping with the difficulties and uncertainties of hookworm treatments as shown in numerous other experiments.

Dog No. 155, weighing 9.5 kilos, was given the same treatment for a total of 18 treatments in 20 days, and was killed 3 days later. In the first 3 days after the first treatment, the dog passed 2 hookworms and 1 was found in the large intestine postmortem. The dog had 2 other hookworms, 19 whipworms and 3 *Dipylidium* postmortem. Efficacy against hookworms, 60 percent; against whipworms and *Dipylidium,* 0 percent. This shows the same peculiarities as regards the resistance of individual hookworms to treatment.

Dog No. 156, weighing 9 kilos, was given the same treatment for a total of 18 treatments in 20 days, and killed 3 days later. The second day after the first treatment, the dog passed 1 ascarid. No worms were found postmortem. Efficacy against ascarids, 100 percent.

Dog No. 157, weighing 12 kilos, was given the same treatment for a total of 19 treatments in 23 days, and killed 1 day later. The ninth day after the first treatment, the dog passed 1 whipworm. The dog had 16 whipworms postmortem. Efficacy against whipworms, 6 percent.

Dog No. 159, weighing 14 kilos, was given the same treatment for a total of 19 treatments in 23 days, and killed 1 day later. The dog passed no worms and had 1 *Dipylidium* postmortem. Efficacy against *Dipylidium,* 0 percent. The preliminary fecal examination of this dog showed fluke eggs; no flukes were detected in the daily examination of the feces or postmortem. However, these flukes, a species of *Alaria (Hemistomum),* are very small, not difficult to detect postmortem, but likely to be destroyed in feces and unrecognizable, and it is likely that the treatment removed them.

Dog No. 162, weighing 12.75 kilos, was given 5 minims of oil of chenopodium in the soft, or soluble elastic, capsule, followed immediately by 2 drams of castor oil, daily, for a total of 12 doses in 13 days, and was killed 5 days later. The second day after the first treatment, the dog passed 1 whipworm. It had 2 *Dipylidium* postmortem. Efficacy against whipworms, 100 percent; against *Dipylidium,* 0 percent.

Dog No. 163, weighing 15 kilos, was given the same treatment for a total of 12 treatments in 13 days, and was killed 5 days

later. The third day after the first treatment, the dog passed 1 hookworm, and 1 *Dipylidium* was found in the cecum postmortem. There were 97 other *Dipylidium* postmortem. Efficacy against hookworms, 100 percent; against *Dipylidium,* 1 percent.

Dog No. 164, weighing 15 kilos, was given the same treatment for a total of 12 treatments in 13 days, and was killed 5 days later. The second day after the first treatment, the dog passed 1 hookworm. It had 3 *Dipylidium* postmortem. Efficacy against hookworms, 100 percent; against *Dipylidium,* 0 percent.

Dog No. 165, weighing 14.5 kilos, was given the same treatment for a total of 12 treatments in 13 days, and was killed 5 days later. The fifth day after the first treatment, the dog passed 1 whipworm. It had 7 whipworms and 5 *Dipylidium* postmortem. Efficacy against whipworm, 13 percent; against *Dipylidium,* 0 percent.

Dog No. 166, weighing 12 kilos, was given the same treatment for a total of 12 treatments in 13 days, and was killed 2 days later. In the 5 days after the first treatment, the dog passed 29 ascarids, and in the 3 days after the first treatment, passed 24 *Dipylidium.* It had 1 whipworm postmortem. Efficacy against ascarids and *Dipylidium,* 100 percent; against whipworms, 0 percent.

Dog No. 167, weighing 14.5 kilos, was given 12 treatments in 13 days, and was killed 2 days later. In the 2 days after the first treatment, it passed 2 ascarids, and in the 11 days after the first treatment, it passed 54 whipworms. It had 12 whipworms and 1 *Dipylidium* postmortem. Efficacy against ascarids, 100 percent; against whipworms, 82 percent; against *Dipylidium,* 0 percent. Owing to an accident while collecting worms postmortem, some whipworms may have been lost, but the efficacy was about 75 percent or more.

Dog No. 168, weighing 11.5 kilos, was given the same treatment for a total of 12 treatments in 13 days, and was killed 2 days later. The day after the first treatment, the dog passed 2 ascarids, and the tenth day after the first treatment, it passed 3 whipworms. It had no worms postmortem. Efficacy against ascarids and whipworms, 100 percent.

Dog No. 169, weighing 12 kilos, was given the same treatment for a total of 12 treatments in 13 days, and was killed 2 days later. The day after the first treatment, the dog passed 2 ascarids. It had 1 *Dipylidium* postmortem. Efficacy against ascarids, 100 percent; against *Dipylidium,* 0 percent.

Dog No. 283, weighing 11.5 kilos, was given 5 minims of oil of chenopodium in soft (soluble elastic) gelatine capsules, followed by 15 mils of castor oil. Treatment was repeated on the third, fifth and seventh days thereafter. The dog was found dead 3 days after the last treatment. In the 8 days following the first treatment, the dog passed 3 hookworms. It had 11 hookworms postmortem. Efficacy against hookworms, 21 percent.

Dog No. 228, weighing 8 kilos, was given chenopodium at the rate of 0.05 m. p. k., with 30 mils of castor oil. The next day the dose was repeated and the dog was killed 6 days after the second treatment. On the day following the second treatment, the dog passed 5 hookworms, and in the 4 days following the first treatment, it passed 31 whipworms. It had 16 hookworms, 175 whipworms, and 2 *Dipylidium* postmortem. Efficacy against hookworms, 24 percent; against whipworms, 15 percent; against *Dipylidium*, 0 percent.

Chenopodium in Doses Repeated During One Day.

(Of the following 7 experiments, the 4 with dogs 293, 294, 299 and 309 have already been published in another paper. They are repeated here for the sake of completion.)

Dog No. 293, weighing 12 kilos, was given one 10-minim soft gelatine capsule of chenopodium every hour for a total of 3 doses, and the last dose was followed an hour later by 15 grams of Epsom salts in simple syrup. During the next 2 days the dog passed 4 hookworms, and was killed the fourth day after treatment. It had no worms postmortem. Efficacy against hookworms, 100 percent.

Dog No. 294, weighing 16 kilos, was given a 10-minim capsule of oil of chenopodium with ⅓ grain of cascarin; this was followed an hour later by a 10-minim capsule of chenopodium and another ⅓ grain of cascarin. In the next 4 days the dog passed 3 hookworms and 1 whipworm. It had 1 hookworm, 21 whipworms, and 6 *Taenia pisiformis* postmortem. Efficacy against hookworms, 75 percent; against whipworms, 5 percent; against tapeworms, 0 percent.

Dog No. 299, weighing 15 kilos, was given one 10-minim soft capsule of chenopodium every hour for a total of 3 doses, and was fed uncooked meat immediately after each dose to see if it afforded protection against the drug in the absence of purgation and also diminished the efficacy. The day after treatment, the dog passed 5 ascarids and 3 hookworms. It was killed the fourth

day. It had 5 hookworms. Efficacy against ascarids, 100 percent; against hookworms, 37.5 percent.

Dog No. 314, weighing 6 kilos, was given one 10-minim soft capsule of chenopodium at 8:30 A. M. and immediately fed some uncooked beef heart and bread. At 2:00 P. M. the dog was given a second 10-minim capsule and offered food, but refused it. At 4:35 it was given a third capsule and food. At 9:00 A. M. the next day the dog was given 30 mils of castor oil. This was an attempt to determine the effects in the administration of a capsule before each meal, advocated by some physicians in human cases of hookworm. The dog passed 2 ascarids the day after treatment, and was killed the fourth day. It had no worms postmortem. Efficacy against ascarids, 100 percent.

Dog No. 309, weighing 14 kilos, was given one 10-minim soft capsule every half hour for a total of 3 doses, the last dose being followed a half hour later by 30 mils of castor oil. At an undetermined interval after getting the castor oil, the dog broke out of its cage and ate some food. No worms were passed. The dog was killed the fifth day. It had 2 hookworms and 6 whipworms. Efficacy against hookworms and whipworms, 0 percent.

Dog No. 148, weighing 13 kilos, was given one 10-minim soft capsule of chenopodium every hour for a total of 3 doses, the last dose being followed immediately by 30 mils of castor oil. The dog passed no worms and was killed the fourth day. It had 6 whipworms. Efficacy against whipworms, 0 percent.

Dog No. 151, weighing 13 kilos, was given one 5-minim soft capsule of chenopodium every hour for a total of 3 doses, the last dose being followed immediately by 30 mils of castor oil. The dog passed 1 hookworm the day after treatment and 2 whipworms the third or fourth day after treatment. The animal was killed the fourth day. It had 1 whipworm postmortem. Efficacy against hookworms, 100 percent; against whipworms, 67 percent.

Where very small doses of chenopodium, 2 minims, were given daily for a total of 12 (1 case), 17 (1 case), 18 (4 cases) and 19 (2 cases) treatments, the efficacy against ascarids was, as usual, 100 percent; against hookworms, 100, 60, 53 and 0 percent; against whipworms, 6, 0, 0, 0, and 0 percent; against *Dipylidium*, 0 percent (5 times). These experiments confirm the idea that chenopodium is successful against ascarids almost always, that repeated doses increase its efficacy against hookworms, and that it should not be regarded as a tæniacide. They also bear out the writer's suggestion that santonin is the remedy

of choice for whipworms, as even these numerous treatments with small doses of chenopodium fail to remove these worms in most cases.

Where larger doses of chenopodium, 5 minims, are given daily for 12 doses, the drug shows the expected efficacy against ascarids, 100 percent (4 cases); an efficacy against hookworms of 100 percent (2 cases); against whipworms, 100 (2 cases), 75 to 82, 13 and 0 percent; and against tapeworms, 100, 1 and 0 (5 cases) percent. The efficacy against tapeworms is to be expected, the base of 100 percent efficacy against tapeworms is an accident, out of keeping with numerous failures on the part of this drug to remove any tapeworms whatever; the whipworm findings indicate that repeated doses of 5 minims daily are much more effective than 2 minims daily; the findings for hookworm are based in both cases on a single hookworm and so are inconclusive.

A test of this same 5-minim dose every other day for 4 days showed 21 percent efficacy against hookworms.

A test of half the therapeutic dose (0.1 m. p. k.), or 0.05 m. p. k., given on 2 successive days, showed 24 percent efficacy against hookworms, 15 percent against whipworms, and 0 percent against *Dipylidium*.

In the repeated doses given in 1 day, three 10-minim doses at hour intervals, followed by Epsom salts, were 100 percent effective against hookworm, and 67 and 0 percent effective against whipworms; the same dose, given with cascarin, was 75 percent effective against hookworms, 5 percent effective against whipworms, and 0 percent effective against tapeworms; the same dose with meat, but without purgation, was 100 percent effective against ascarids and 37.5 percent effective against hookworms, the same dose, given 3 times during the day with food, was 100 percent effective against ascarids; the same dose, given every half hour and followed a half hour later by castor oil, was 0 percent effective against hookworms.

The foregoing suggests that chenopodium in repeated doses of 5 minims daily for 12 doses is rather efficacious against ascarids, whipworms, and, probably, hookworms. But such prolonged treatment is objectionable from the standpoint of the practitioner. The use of three 10-minim doses at hour intervals, followed by a purgative an hour later, gives promise of success in treating dogs as in treating man for hookworms, but, even as in that case, repeated treatments will not infrequently be

necessary. This subject demands more data. Prolonged experience to date only enables us to formulate the following statements with regard to oil of chenopodium:

Oil of chenopodium has no equal as a drug for the removal of ascarids, as it will in the big majority of cases remove 100 percent of the worms present in the dog, and is apparently about as effective, under proper conditions of administration, against ascarids of man and swine. It is apparently as effective as anything against ascarids in the horse and will probably give satisfactory results when it has been sufficiently studied to ascertain the proper dose and mode of administration.

Chenopodium does not have, in our experience, as much value for removing hookworms in single therapeutic dose as does chloroform, but such experimental evidence as we have, together with the clinical evidence of thousands of human cases treated with chenopodium, indicates that in repeated doses, either at hour intervals or on consecutive days, it should prove reasonably satisfactory against hookworms in dogs.

No drug can be depended on to remove whipworms when given in single dose, as the writer has stated elsewhere. Repeated doses of oil of chenopodium, 5 minims daily for 12 days, for instance, seem to give rather good results and warrant further investigations along this line. But the fact that santonin is not a gastro-intestinal irritant gives it the choice for use against whipworms, so far as we are aware at present. It can be given in doses of a half-grain or a grain daily, with equal amounts of calomel, and seems entirely safe when so given, so far as our experiments show.

Chenopodium will occasionally remove tapeworms, but the numerous failures to remove any in a long series of experiments show positively that it cannot be regarded as a suitable anthelmintic for the removal of tapeworms, so far as dog tapeworms are concerned, and so far as findings in regard to them can be applied to other tapeworms and hosts.

The national prohibition amendment will do one good thing, anyway, in the opinion of a well-known horseman of Salina, Kansas. It will give the horses enough to eat. "Closing the breweries has practically killed the demand for barley," said Mr. Price. "Barley makes excellent feed for horses, and with corn, bran and chops at their present high prices, this is the solution of a problem."

CLINICAL AND CASE REPORTS.

SARCO-CHONDRO-OSTEOMATA OF A HEN.

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From the Laboratory of Pathology of the
North Carolina Experiment Station.

Sarcomata develop either in previously normal tissue belonging to the connective-tissue group—as, subcutaneous tissue, or connective tissue of glands, etc. — or in some preëxisting connective-tissue tumor, as a fibroma, chondroma, etc. The transformation of the parent tissue into tumor tissue takes place through the growth and multiplication of the existing cells. The division of the cells takes place chiefly by mitosis.

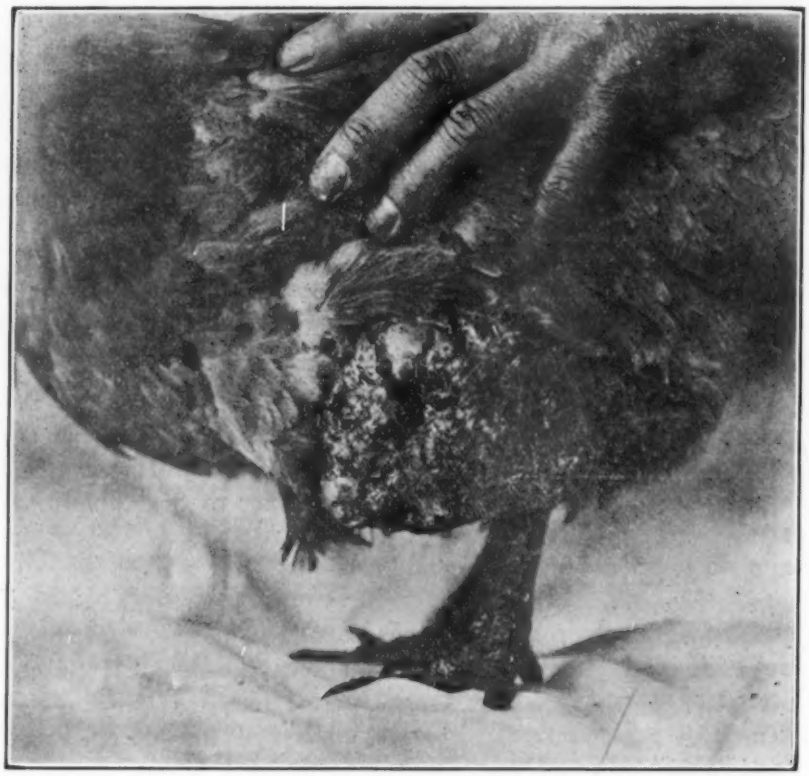

FIGURE 1.
Sarco-Chondro-Osteomata of the Tibial Region of a S. C. Rhode Island Red Hen.

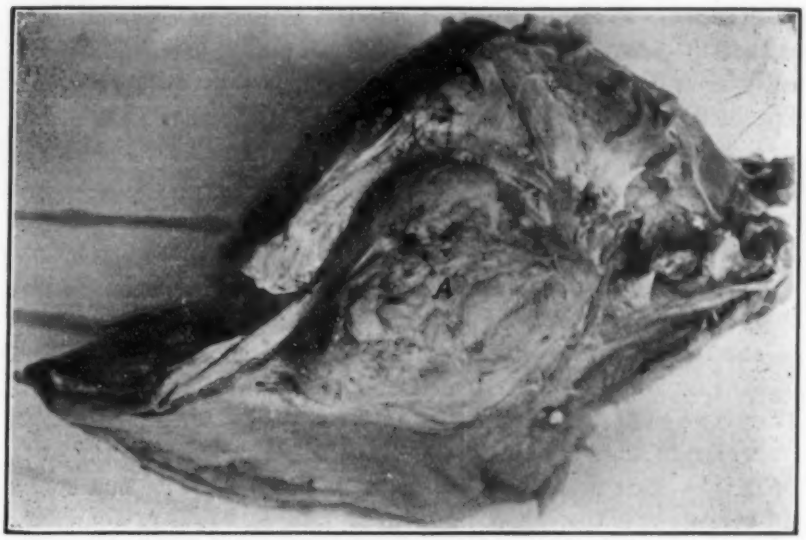

FIGURE 2.
Sarco-Chondro-Osteomata of the Thoracic Wall of a Hen. *A*, the Tumor.

Chondromata develop chiefly in those places where cartilage is found normally—that is, in the osseous system or in the cartilage of the respiratory tract; but they also occur in tissues which normally possess no cartilage—for example, in the salivary glands, and in the testicles and more rarely in other organs.* Like sarcomas, chondromas may be associated with other tumor tissue as sarcoma, myxoma, fibroma, etc. The cartilage may become ossified, forming osteomatous tissue.

Osteomata is applied to tumors consisting of osseous tissue. Such growths arise chiefly from the bones of the skeleton, but may develop elsewhere. The abundant production of bone in a chondroma leads to the formation of an osteochondroma.

Sarcomata are particularly liable to secondary changes. Areas in the tumor may show a decided disposition to complete the developmental tendency of connective tissue. As a result of such processes true bone formation may occur—osteosarcoma; or cartilage may be produced—chondrosarcoma.†

Case Report.

The case here described furnishes a tumor of multiplicity of tissues of a conjunctive nature. Similar tumors have been described in the bitch by Petit of France.

* Ziegler, Ernst. General Pathology. Wm. Wood & Co., New York, 1908.
† Manual of Pathology, Coplin, W. M., P. Blakiston's Sons Co., Philadelphia, Pa., 1908.

History.—A Single Comb Rhode Island Red hen was brought to the laboratory with the report that an enlargement had gradually been developing on the tibia just above the hock (Fig. 1). The bird was thin in flesh. There were also other tumors observed on the sides of the thoracic walls. The bird seemed to suffer no inconvenience, having a good appetite, and appeared happily disposed. The bird was killed by gas in the death chamber for autopsy purposes.

Autopsy findings.—There is observed an irregular-shaped tumor on the left thoracic wall measuring 2 x 2 x 1.5 cm. There is also an irregular-shaped tumor on the right thoracic wall measuring 7 x 6 x 2 cm. This latter tumor is shown in Fig. 2A. These two tumors were attached to the ribs. A third hard tumor, irregular in shape, was observed on the leg just above the hock (Fig. 1). This tumor measured 7 x 10 x 11 cm. The tumor had no capsule; on the other hand, presented rather a raw surface. It sprang from the subcutaneous connective tissue. Both macroscopic and microscopic examination was made of these tumors. A sagittal section is shown of the tumor from the leg in Fig. 3. At *a* will be seen an osseous ulcer containing true bone tissue; at *b* is seen fibro-cartilage of this bone; at *c* is sarcomatous tissue;

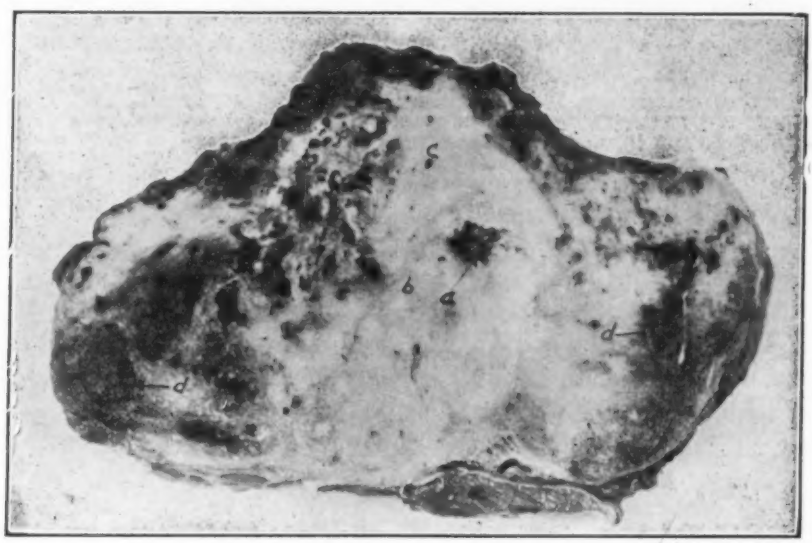

FIGURE 3.

Sagittal Section of the Sarco-Chondro-Osteomata Shown in Figure 1. *A*, Osseous Ulcer; *B*, Fibro-Cartilage; *C*, Sarcomatous; D, Hemorrhagic Spots, Frequent in Sarcomas; *E*, Skin and Subcutaneous Tissue from Which Tumor Sprang.

at *d* is seen hemorrhagic spots, frequent in sarcomas; at *e* is the skin and subcutaneous tissue from which the tumor springs. The sarcomatous elements are of the large spindle-celled variety.

FAILURE OF BLACKLEG CULTURE FILTRATE TO CONFER LASTING IMMUNITY IN ANIMALS VACCINATED UNDER SIX MONTHS OF AGE.

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In January, 1918, two yearling heifer calves died of blackleg on the campus hill pasture occupied by the University Certified Dairy. This was the first appearance of the disease on this land, despite the fact that it had been used constantly for cattle during the last fourteen years and no preventive vaccination given.

Cultures were made from the tissues of the second animal and *B. Chauvei* isolated by Dr. J. Traum, in the Veterinary Science Laboratory. The remaining animals, numbering 23 head, were vaccinated on January 23, 1918, with blackleg culture filtrate, including one calf, No. 2062, which was born December 22, 1917, and was one month old at time of vaccination. On May 28, 1918, calf No. 2062 was found on the pasture with a large crepitating swelling on the left shoulder. One hundred and fifty mils of blackleg serum were immediately given subcutaneously, a portion at several points around the circumference of the swelling and fifty mils intravenously. The following day 100 mils additional were given intravenously. The animal recovered, but months elapsed before the swelling had entirely disappeared and at present writing, one year after the attack, the animal is unable to perfectly use its left shoulder. It, therefore, had lost its immunity and became naturally infected with the disease four months and five days after being vaccinated.

On May 29, 1918, twenty animals were vaccinated, ten receiving culture filtrate and ten tissue filtrate (aggressin). All of these animals had received a previous dose of culture filtrate on January 23. It was decided not to again vaccinate these animals unless more deaths occurred, and at the same time new calves weaned and turned on the range were to be given but one vaccination. No cases of blackleg have occurred in the twenty head, sixteen of which are still on the range, three having been killed and one died from an injury.

The latter part of December, 1918, three weaned calves were vaccinated for the first time with culture filtrate and turned on the pasture. One of these calves, No. 2064, was born on September 7, and was therefore over three months old when vaccinated. On April 18, 1919, this animal was found dead and a positive diagnosis of blackleg made and *B. Chauvei* isolated. This animal, therefore, had lost its immunity and succumbed to a natural infection with blackleg four months after being vaccinated.

In many parts of California it is necessary to vaccinate calves well under six months of age, to prevent losses. When such vaccination is applied to young animals it should be repeated twice yearly, the same as though the old muscle vaccine were being used.

TENDONITIS AND PERIOSTITIS RESULTING FROM INJURY BY A CELLULOID SPIROLET LEG BAND.

B. F. KAUPP,
From the Laboratory of Pathology of the
North Carolina Experiment Station.

HISTORY.

A one-year-old Single Comb Rhode Island Red cock from pen 26 trap-nested Rhode Island Reds on the Experiment Station poultry plant. The bird had always been in good health. He was marked with a celluloid leg band for purpose of identification. The band had worked its way to near the hock and had become, by pressure, partly imbedded into the skin of the region. As a result of this injury tendonitis and later productive inflammation with periostitis developed.

SYMPTOMS.

The bird was first noted to be lame. Upon examination the spirolet band was found injuring the leg and was removed. The bird continued to become worse and was finally removed from the flock and placed in the hospital.

The posterior portion of the leg in the metatarsal region was swollen and appeared to contain an abscess. The part was lanced and a quantity of cheesy pus removed. This treatment was repeated at intervals of about ten days for about a month. After curetting, each time, the wound was treated with iodine. Finally the abscess condition appeared to have disappeared but there

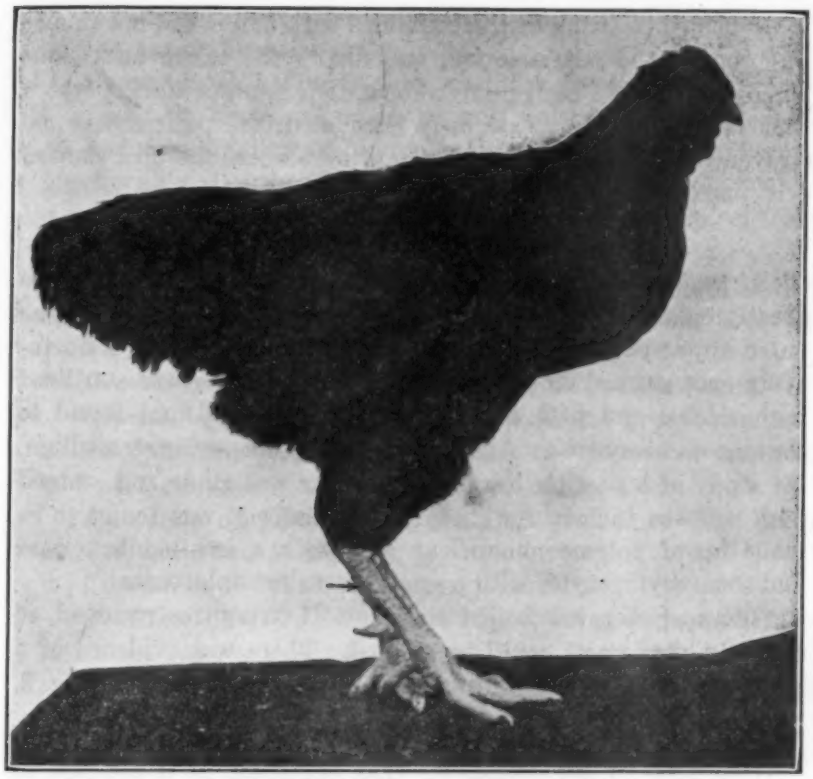

FIGURE 1.
Early stages of tendonitis caused by injury in a S. C. Rhode Island Red cock.

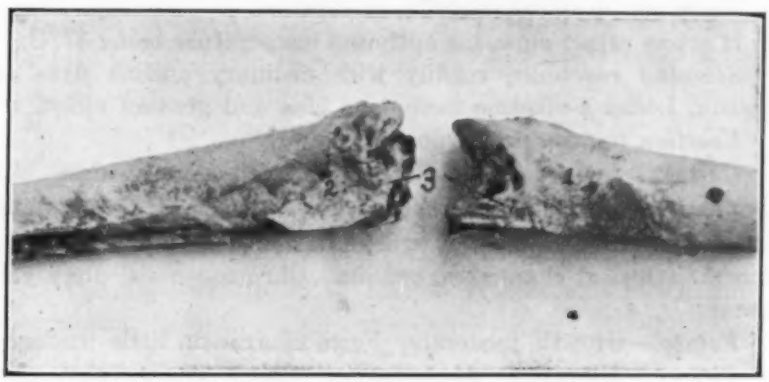

FIGURE 2.
Periostitis with exostaosis of distal end of tibia and proximal end of metatarsus. 1, tibia; 2, metatarsus; 3, bony deposits.

was a productive inflammation involving the tendons of the flexor region and the other soft structure, as shown in Fig. 1.

Repeated painting of these tendons with iodine did not in any way control the inflammation, and finally the entire hock joint became affected. Finally, after about four months, during which time the bird became extremely emaciated, the patient was destroyed for study purposes. During these weeks the bird showed evidence of considerable pain.

Autopsy.

A post-mortem examination showed the hock joint to be greatly enlarged and hard to the touch, with the exception of the outer upper portion of the enlargement, which showed a fluctuating spot suggestive of an abscess. This surface was sterilized with alcohol and with a sterile knife was lanced and found to contain a cheesy pus. After inoculating some culture medium, for study of a possible organism, a smear was made and stained with aqueous fuchsin for study. This material was found to be made up of polymorphonuclear cells with a few mononuclears and some erythrocytes with a small coccus or diplococcus.

The specimen was boiled and the soft structures removed, so that the bony parts could be studied. There was evidence of a periostitis with abundant exostosis formation, as shown in Fig. 2.

Bacteriological Study.

Character of the organism.—The organism, as it appears in prepared specimens, is a small coccus about 0.7 micron in diameter and appears single, in pairs, or in groups.

There are no spores, flagella, or capsules.

It grows rather slow, the optimum temperature being 37°C.

Staining reactions, readily with ordinary aniline dyes as fuchsin, Löffler's alkaline methylene blue and gentian violet.

Reaction to gram stain, positive.

Cultural features.—Agar stroke, growth slow at first, was abundant by the end of 48 hours. Form of growth, echinulate. Elevation, raised. Luster, glistening. Topography, surface smooth. Optical characters, opaque. Chromogenesis, dirty yellow.

Potato.—Growth, moderate. Form of growth, little tendency to spread. Elevation, flat. Luster, dull. Topography, contoured.

Chromogenesis.—Light orange-yellow. Diastatic action, strong.

Agar Stab.—Growth, moderate. Best on top. Line of puncture, scant and echinulate.

Gelatin Stab.—Growth slow with liquefaction after ten days.

Nutrient Broth.—Surface growth, small pellicles at end of 48 hours. Clouding, diffuse cloudiness, later medium becomes clear with a slightly yellowish sediment.

Milk.—Coagulates milk in 9 days at 37°C., with very slow digestion of the curd. The coagulum is very firm.

Agar Colonies.—Colonies at the end of 24 hours vary in diameter up to 1 mm. The edges are smooth and the color is orange-yellow.

Growth in Broth Over Chloroform.—No growth occurs.

Growth in Glycerol Broth.—The organism grew abundantly in the open arm without gas formation. There was formation of 5 per cent acid.

Reduction of Nitrates.—At the end of 14 days there was a marked reduction of nitrates.

Formation of Indol.—Negative.

Growth Under Oil.—Slow growth, showing it to be a facultative anærobe.

Thermal Death Point.—Time of exposure in water bath, 10 minutes.

Temperature (C)	24 hours	48 hours	72 hours	96 hours	7 days
Control	+	+	+	+	+
46	+	+	+	+	+
50	+	+	+	+	+
54	+	+	+	+	+
58	—	—	+	+	+
62	—	—	—	—	—
64	—	—	—	—	—

The exposure to 58°C. arrests growth and 62°C. kills the organism.

Below is given the results of the action of this organism on six different sugars. All fermentation tubes contained 1% of the sugar. Titration made at the end of 14 days.

Sugar	Control	Tube 1	Tube 2	Average
Maltose	0.5	3.0	3.5	3.25
Dextrose	0.5	4.5	4.5	4.50
Saccharose	0.5	3.0	3.5	3.25
Mannite	0.5	5.5	5.0	5.25
Lactose	0.5	4.5	4.5	4.50
Raffinose	0.5	0.5	0.5	0.50

There was no change in the raffinose. There was strong acid formation in the maltose, dextrose, saccharose, mannite and lactose.

This organism corresponds to type A of Staphylococcus aureus as indicated by McFarland.[1]

This organism corresponds very close to M1 as described by Jones,[2] though an absolute comparison cannot be made owing to the fact that Jones titrated at five days and we titrated at 14 days. However, we have, as in his M1, the organism-forming clumps, orange to orange-yellow (his was orange), milk firmly coagulated, fermentation with acid production in dextrose, lactose, saccharose and maltose, with no acid formation in raffinose. We did not try our organism in silicin or inulin. Our organism belongs to the staphylococcus group and not to the galactococcus group.

In terms of the numerical system of recording the salient characters of an organism (group number), as suggested by the Society of American Bacteriologists, we have as a total 221.2223612.

Pathogenicity.

In the early part of this paper it was shown that this organism was isolated, in pure culture, from the shank of a Single Comb Rhode Island Red cock. The following inoculations were made upon other birds.

[1] Joseph McFarland, Pathogenic Bacteria and Protozoa, p. 342, 1912.
[2] F. S. Jones, Studies in Bovine Mastitis, III. Infection of the Udder with Micrococci and Other Microörganisms. Jr. Exp. Med., Dec. 1, 1918, Vol. xxviii, No. 6, pp. 721-733.

Case No. 1.—A Single Comb White Leghorn hen, leg band No. A13, was inoculated with 3 c.c. of an emulsion in bouillon into the left shank, forcing the liquid along the flexor tendons and around the hock. The bird at the end of 24 hours showed great depression, lameness and a partial loss of appetite. Considerable local reaction resulted, the part being hot and sensitive to touch. The bird was unable to use its leg, gradually became emaciated, finally a total loss of appetite with fatal diarrhœa, the bowel discharges being of a greenish-yellow color and fluid in consistency. The bird died on the 24th, or eleven days after inoculation.

Upon opening the abdominal and thoracic cavities the organs appeared normal, with the exception of the kidneys, which appeared a grayish color, indicating a possible cloudy swelling. Cultures were made from the kidneys, liver and heart blood. The swelling of the shank at the point of inoculation had subsided. All inoculated tubes showed pure cultures of the Staphylococcus pyogenes aureus inoculated. The organism, in this case inoculated subcutaneously into the shank, produced a local reaction which subsided in a few days without suppuration, and a fatal septicemia, which caused the death of the bird in eleven days, giving the above clinical picture.

The liver and kidneys, upon microscopic examination, showed cloudy swelling.

Case No. 2.—A Single Comb White Leghorn hen, leg band No. 42, was inoculated with 4 c.c. of an emulsion in bouillon subcutaneously and in the left shank. The point of inoculation, at the end of 24 hours, was hot and painful to the touch, indicating a rather violent local reaction. There was a gradual loss of appetite, with resultant loss of flesh. Diarrhœa developed, but subsided in about ten days. This bird was inoculated on January 13, 1919. On March 6, 1919, she was observed and measurements taken. Her original weight was 3.1 pounds; she now weighed 2.5 pounds and appeared cheerful. The left hock was enlarged with apparent exostosis and the leg could not be extended, it apparently being in constant flexion, perhaps due to the fact that the bird, unable to use the leg, held it constantly in a flexed position. The right hock measured 5.5 c.m. in circumference and the left, or inoculated hock, 7 cm. in circumference. The inoculation was not made directly into the hock but midway of the metatarsus and by pressure forced up into the hock along the flexor tendons. The bird now has a good appetite.

The bird was killed in the death chamber and shank cooked to determine the extent of exostosis that had taken place. It was evidenced that the bird had gained considerable of her weight she had lost as a result of the severe symptoms following the injection, in which there appeared a possible septicemia but from which she had now entirely recovered with the exception of the hock lesion.

After cooking out the tibia and metatarsus an examination of the bones revealed an ulceration, or destruction of the articular cartilage of the upper distal end of the metatarsus, and a beginning exostosis of the distal end of the tibia outside the ulcerated portion. This organism has, then, reproduced the condition found in the cock from which it was first isolated.

Case No. 3.—A Single Comb Rhode Island Red cockerel, eight months old, was inoculated in the right shank. The method of inoculation was as follows: A sterile thread was pulled through between the flexor tendons by aid of a curved needle. As the string was pulled through a loopful of the culture from an agar slant was placed upon it so that inoculation was along the course of the string, thus making a foreign body by clipping the string close on each side of the leg. The inoculation was made on January 29, 1919, and on February 2, 1919, there was noted an acute suppurative process following the usual symptom of heat, swelling and painfulness to the touch. Like the two preceding inoculations, the bird was not able to bear any weight on the inoculated leg and, in fact, held the leg suspended in the air. This was followed by a gradual loss of appetite with gradual emaciation, and the bird died at 2 p. m., February 12, 1919, in a very emaciated condition. Like the two previous cases, the bird developed a diarrhœa, the bowel discharges being of a yellowish-green color.

Autopsy.

After the skin in the region of the point of inoculation of the shank had been sterilized with alcohol an incision was made into the point of inoculation. There was present a small amount of cheesy pus along the thread, from which a pure culture of the Staphylococcus pyogenes aureus was obtained. The kidneys appeared a pale gray, indicating a cloudy swelling. The ureters were blocked, being distended with a pasty material in the anterior portion, and a watery material in the posterior part. Sectioned surfaces of the kidneys showed both active and passive

congestion. Pure culture of the organism was recovered from the kidneys and also from the liver. The liver was dark in color and apparently congested, as noted from the sectioned surface.

Microscopic Study.

Liver, both active and passive congestion. Cloudy swelling is present. In some sections the nuclei stain faintly or not at all, and the cytoplasm in these cells stains very faintly. These areas are nearing a state of focal necrosis. In these areas there are noted some cells in a state of mitosis.

Kidneys, both active and passive congestion is present. In the convoluted tubules to some extent, and to a greater extent in the collecting tubules, there are noted both polymorphonuclear and mononuclear leucocytes. Cloudy swelling of the cells of the tubules is present and in some zones the cells are swollen and their bases have left the periphery and moved toward the center, partially, and in some cases completely, clouding the lumen. In some areas the cytoplasm and nuclei stain very faintly and are apparently nearing a state of focal necrosis.

Case No. 4.—Rabbit inoculation. To determine if this organism will produce a suppurative inflammation in the rabbit there was given subcutaneously to a half-grown hare 2 c.c. of a bouillon culture. At the end of 24 hours there was slight induration at the point of inoculation, with some heat and tenderness. By the end of the third day all indications of a disturbance at the point of inoculation had subsided. This is only one test, but in this case the organism failed to produce abscess.

Summary.

There is here presented a case of infection of the fowl with the Staphylococcus pyogenes aureus. The organism is isolated in pure culture from an abscess of the hock.

Infection of the hock with Staphylococcus pyogenes aureus in this case caused abscess, with exostosis and immobility of the joint.

Inoculations of the above organism into other fowls produced in one a similar condition of abscess and exostosis. In others it caused a fatal septicemia, the organism being reisolated from the kidneys, liver and heart blood.

In one inoculation of the hare subcutaneously by the above organism no abscess or septicemia was produced.

PSEUDO–LEUKAEMIA IN A DOG.

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Department of Small Animal Diseases, and
S. A. Goldberg,
Department of Pathology,
New York State Veterinary College, at Cornell University, Ithaca, N. Y.

A three year old grey fox hound male. The owner stated that the animal progressively lost weight for about two months. The clinical examination showed the animal greatly emaciated, the ribs and hip bones standing out prominently. He showed slight dullness and depression. All the external lymph glands were enlarged, firm and prominent. The abdomen was slightly tucked up, and palpation showed several large hard masses, probably enlarged lymph glands. The temperature for five days varied from 102.3°F. to 103.4°F.; the pulse varied from 108 to 120; the respiration varied from 24 to 50. Blood examination showed Hæmoglobin 96%, Erythrocytes 3,146,000, Leucocytes 7200. No differential count was made. Presumptive diagnosis, pseudoleukæmia or Hodgkin's disease. The animal was destroyed by chloroform.

Autopsy protocol.—The external examination showed the animal to be greatly emaciated. All the superficial lymph glands were greatly enlarged. The mucous membranes and conjunctivæ appeared normal.

Internal examination showed the animal to be in very poor condition. There was very little subcutaneous and subperitoneal fat. The peritoneum, as well as the arrangement of the organs, was normal.

The spleen was of a bright red color throughout. It was greatly enlarged, being 29 cm. long, 14 cm. wide at its widest point, gradually tapering down to 6 cm. at its opposite end, and 3 cm. thick at the thickest point. It weighed 316 gms. On section it bulged. There were rounded whitish nodules, .5 mm. to 2 mm. in diameter, uniformly distributed throughout the splenic pulp. Microscopically, the splenic pulp was nearly entirely gone. There was an infiltration of round cells resembling lymphocytes throughout. There was also considerable hyperæmia. The trabeculæ were also greatly infiltrated by round cells.

The kidneys were slightly lighter than normal. On section they bulged slightly, the cortices were somewhat lighter than normal. There was a red zone of hyperæmia between the cortices and medullæ. The medullæ were normal. Microscopically, the

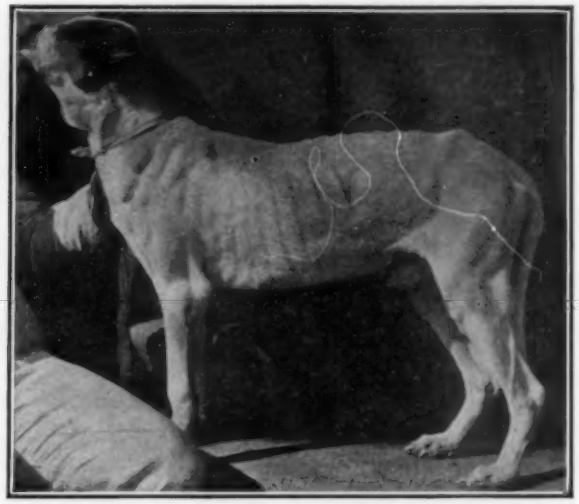

FIGURE 1.

glomerular arterioles were markedly congested. Most of the Bowman's capsules were filled with coagulum. The convoluted tubules showed marked cloudy swelling. There were few casts in the straight tubules.

The liver was slightly enlarged and lighter in color than normal. It appeared normal in consistency. The lobules were apparent. The centers of the lobules were red, while at the periphery they appeared yellowish white. On section blood oozed out. The liver tissue appeared somewhat hazy. It bulged very slightly on section. Weight of the organ was 950 gms. Microscopically, all the periportal spaces and the interlobular connective tissue were infiltrated by small round cells resembling lymphocytes. There was less infiltration around the central veins. The liver cells showed granular and fatty degeneration and there was some congestion of the sinusoids.

There was little greyish semiliquid feces in the intestines. The stomach was nearly empty. The mucosa of the intestines was uniformly thickened, of a greyish color and thrown into folds. The other coats were also somewhat thickened. The Peyer's patches were apparently not enlarged. Microscopically, the intestinal mucosa showed marked mucoid degeneration. Practically the entire epithelium was replaced by goblet cells. There was a marked increase in the connective tissue of the submucosa. The other coats were normal.

FIGURE 2.

The prostate gland was somewhat enlarged, otherwise the genital organs appeared normal. Microscopically, the prostate gland showed hypertrophy and degeneration.

The bone marrow was lighter in color than normal, otherwise it was apparently unchanged.

In the brain the meninges were congested, the lateral ventricles were apparently somewhat distended. The floor of the lateral ventricles and the choroid plexuses were somewhat congested. Microscopically, the meninges showed some congestion, otherwise the brain appeared normal.

The pleuræ were apparently normal. The lungs showed some anthracosis, otherwise they appeared normal.

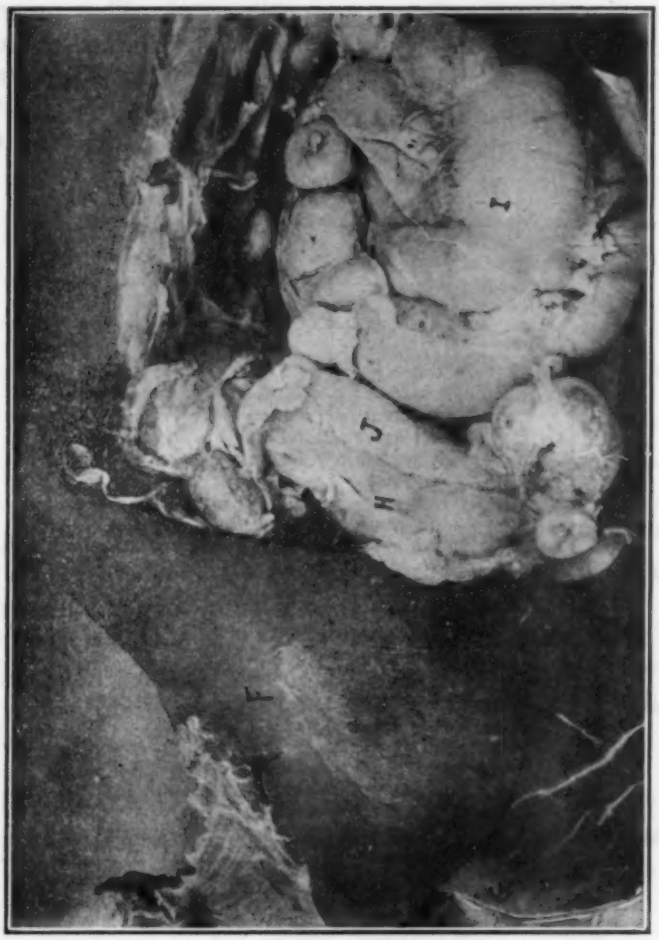

FIGURE 3.

In the heart the myocardium was lighter in color than normal. The valves, endo, and pericardium were normal. The coronary vessels were congested. Microscopically, the myocardium showed marked cloudy swelling, the epicardium showed some congestion. There was no lymphocytic infiltration in any part of the heart muscle.

All the lymph glands were greatly enlarged, some were slightly congested, but most of them were of a greyish or yellowish grey color. On section they bulged and appeared homogeneous. The larger lymph glands showed some softening in the center. The lymph vessels draining into the lymph glands were prominent, as were also the lymph ducts. Microscopically, the structure of the lymph glands was entirely changed. The lymph

nodules, as well as the sinuses, were obliterated. They presented a uniform mass of lymphocytes, some of which showed degeneration. The trabeculæ and the capsules were infiltrated by lymphocytes. The following is a description of the lymph glands in detail, giving the dimensions in centimeters and the weights of the groups in grams:

	Number of Glands Found	Dimensions in Centimeters				Wt. of Group in gms.
		First	Second	Third	Fourth	
L. Submaxillary	3	6x3x2	4x4x2.5	3x2x1	.....	45.5
R. "	3	6.2x4.5x2.3	3.4x3x3.2	3x3.2x1.3	.....	48.5
L. Subparotid	2	2x1.7x.9	.9x.8x.5	.....	.....	5.5
R. "	2	2x1.8x1.2	2.3x1x.8	.....	.....	8.0
L. Retropharyngeal	2	8.5x4.5x2.5	3.2x1.9x.8	.....	.....	55.0
R. "	1 Constricted at each end	Body 6x4x2.5	Ant. Const. 2x2x1	Post. Const. 4x4x3.2	.....	49.0
L. Prescapular	2	7.2x6.4x3	7x4.5x2.5	.....	.....	107.0
R. "	2	7x5.5x4	6.5x4.7x3	.....	.....	112.5
L. Subscapular	1	5.5x5x2	.....	.....	.....	33.5
R. "	1	3x2x1	.....	.....	.....	15.0
L. Bronchial	1	7x2.5x2	.....	.....	.....	.....
R. "	2	See below	2.8x1x1	.....	.....	19.0
L. Renal	2	3.8x1.8x1.2	1.9x1x.6	.....	.....	.....
R. "	3	3.1x1.8x1.8	2.5x1.2x.8	1.3x.5x.5	.....	18.0
L. Int. Inguinal	2	1.9x1.6x1	1.8x1.5x1	.....	.....	.....
R. "	2	2.8x2x1.4	.7x.7x.7	.....	.....	14.5
L. Sacral	1	2.8x1.8x1.2	.....	.....	.....	.....
R. "	3	2.5x1.5x1.4	2.5x1.5x1	2.5x1.4x.9	.....	16.0
L. Ischiatic	1	1.6x1.3x.7	.....	.....	.....	.....
R. "	1	2.3x2x1.2	.....	.....	.....	7.5
L. Ext. Inguinal	1	7x4x2.3	.....	.....	.....	.....
R. "	1	8x5x3.5	.....	.....	.....	100.0
L. Popliteal	1	5x3.5x2.5	.....	.....	.....	.....
R. "	1	5x3.5x2.5	.....	.....	.....	56.0
Sternal	6	3.2x2.5x1.6 5th	4x2.5x1.5 6th	3.3x2.3x1.2	2.5x1.7x1.3	.....
		1.6x1.4x1.1 Smallest	1.7x1.3x.9 Largest	.....	.....	30.0
Mediastinal	11	.8x.6x.4	2.5x1.5x1	.....	.....	25.0
Gastric	2	4.5x3x2.5	1.2x1.2x1	.....	.....	.....
Pancreatic	4	7.1x3.7x3.7	3.5x2.5x2.5	1.9x1.3x1.5	1.5x1.2x.9	82.5
Hepatic	3	12x8.5x5	5x5x3.5	1x1x1	.....	267.0
Rectal	3	5x3.2x2.5 Largest	3.9x2.7x2	2.9x2.5x2 Smallest	.....	35.5
Lumbar and Sublumbar	12	8x4.5x3.5	2x1.2x.8	.....	.....	129.0

A few of the lymph glands are worthy of special mention. The mesenteric gland was in the form of a coiled mass surrounding the cæcum and the ileo-cæcal valve. The coil was 15 cm. in diameter and 9 cm. thick. It weighed 637 gms.

There was a group of lymph glands in the region of the vena cava and the abdominal aorta on the abdominal surface of the

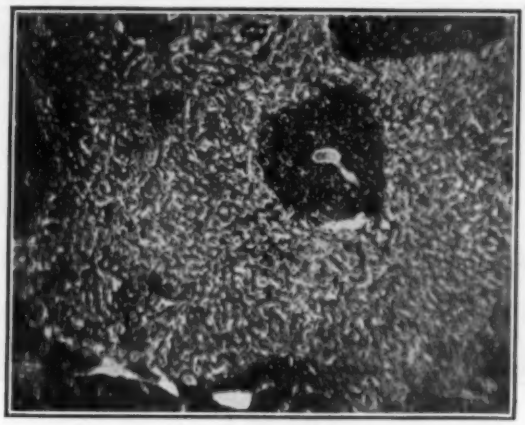

FIGURE 4.

diaphragm. The largest was at the aorta, 5x2x1.5 cm. The others, six in number, were around the vena cava. The largest was 3.2x1.2x.6 cm.; the smallest 9 mm. long and 5 mm. in diameter. The weight of the group was 20 gms.

One of the right bronchial lymph glands was constricted in the center and this constriction embraced the right bronchus. Each of the ends measured 2x1.8x1.3 cm. The constricted part measured 2.3x.9x.6 cm.

There was one triangular-shaped irregularly lobulated lymph gland at the posterior bifurcation of the trachea fitted in between the two large bronchi and closely adherent to each bronchus. One side measured 4x3.2x2 cm.; the other side 5x3.2x1.7 cm. It weighed 20 gms.

The weight of all the lymph glands placed on the scale was 1911.5 gms., the computed weight is 1847.5 gms.

The thyroid glands were considerably enlarged. They were held together by an isthmus so that they appeared as one horse-shoe-shaped thyroid, somewhat similar to that of man. The right lobe was 4.6x2.3x.6 cm. The left lobe was 5.7x2.3x.9 cm. The isthmus was 3.3x1.7x.2 cm. What appeared to be the parathyroids were embedded at about the middle of the external surface of each lobe. Each measured 8x4x3 mm. The total weight of the thyroids and parathyroids was 18 gms. Microscopically, the thyroid glands have lost their normal structure. There was no colloid in the follicles. The number of cells in the follicles was increased. Most of them were broken away from their base-

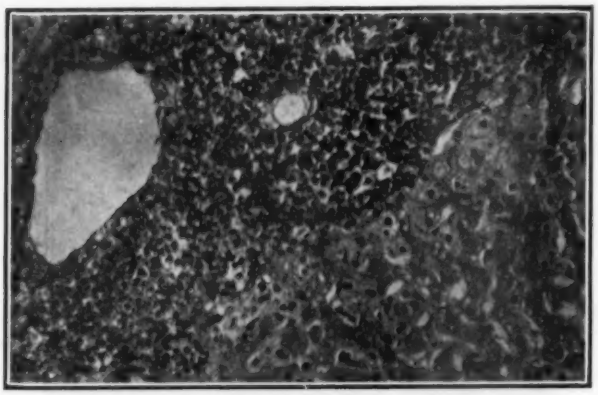

FIGURE 5.

ment membranes and were markedly degenerated. There was slight active hyperæmia.

Bacteriological Examination.—Media inoculated from the liver gave a growth of micrococcus pyogenes aureus; from the spleen no growth resulted; from the brain a growth of micrococcus pyogenes citreus was obtained.

Diagnosis.—*Immediate cause of death,* chloroform poisoning. *Fatal illness,* pseudo-leukæmia. *Old lesions,* hypertrophy of prostate; chronic catarrhal enteritis, colitis, etc.; parenchymatous strumitis. *Parasites,* none found.

Remarks.—The acute parenchymatous nephritis, the degeneration of the liver and myocardium were either secondary to the pseudo-leukæmia or due to the chloroform poisoning, perhaps both.

According to the history, the duration of this condition was apparently two months. It is possible, however, that the condition was unnoticed for a considerably longer period. In man the condition is sometimes present for years before the patient thinks of consulting a physician.

The weight of the animal was 21 kilos. The spleen and the lymph glands were approximately 11 per cent of the body weight of the animal.

It is doubtful whether the condition of the parathyroids and thyroids had any relation to the pseudo-leukæmia.

This disease is to be differentiated from lymphosarcomatosis. The latter is more malignant and rarely are all the lymph glands affected. In lymphosarcoma the groups of glands are usually in one indistinguishable mass, and the lymph glands are closely

adherent to the surrounding tissues. They are also more or less nodular. In this case all the lymph glands were affected, they were not nodular, they were separate from each other, and not adherent to the surrounding structures. Leukæmia is ruled out on account of the normal blood picture. Tuberculosis and chronic productive lymphadenitis were excluded on microscopic examination. This leaves the only possibility, that of pseudo-leukæmia.

DESCRIPTION OF PLATES.

FIG. 1. The living animal showing emaciation and enlarged superficial lymph glands.

FIG. 2. Proximal portion of animal exposed. (The lungs were removed.)

A. Submaxillary lymph gland.
B. Prescapular lymph gland.
C. Subscapular lymph gland.
D. Lymph duct.
E. Mediastinal lymph glands.

FIG. 3. Abdominal portion of animal exposed. (The stomach and most of the intestines were removed.)

F. Spleen greatly enlarged.
G. Liver.
H. Pancreatic lymph gland.
I. Mesenteric lymph gland.
J. Pancreas.

FIG. 4. Section of liver. x55. Showing an increased number of lymphocytes in the periportal spaces.

FIG. 5. Same as Fig. 4. x180. Showing a bile duct, a vein, and an arteriole completely surrounded by lymphocytes. Also fatty degeneration of the cords of liver cells.

Major Horace B. F. Jervis has returned from service overseas and is again located at Houlton, Maine.

After having served with the 88th Division for a year in France, Lieutenant Roy H. Tesdell has returned to his home at Huxley, Iowa.

Lieutenant J. Earle Gilfillan has received his discharge from the Army and has returned to practice in Wilmington, Del. Lieutenant Gilfillan has been located at Camp Devens, Mass., for the past several months.

SUBCUTANEOUS TUBERCULIN RETEST OF CATTLE.

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Professor of Bacteriology,
Ontario Agricultural College, Guelph, Ontario.

We have recently had an opportunity of testing Gilliland's theory that "If animals that had given a suspicious reaction were to receive five to ten days later a much larger dose they would give a strong reaction if tuberculous, and a negative result if non-tuberculous."

Reports verifying this theory were made by C. J. Marshall and H. W. Turner of Pennsylvania at the 54th annual meeting of the American Veterinary Medical Association, Kansas City, Missouri, August, 1917, as recorded in the Journal of the American Veterinary Medical Association, Vol. 52, December, 1917.

On March 12 the temperature readings of a herd of pure-bred dairy cattle that had been subjected to the subcutaneous tuberculin test were submitted to us for consideration. The herd was one which had been systematically tested every six months for eight years and reactors either slaughtered or, when in apparently good condition, removed to a stable in which were kept only reactors. The calves produced by these animals were removed as soon as born and fed milk from the healthy stock, the Bang system being followed for the eradication of the disease from the herd. Most of the animals were calved on the premises. Any new stock purchased was not allowed to mix with the herd until tuberculin tested and shown to be negative to the test.

Notwithstanding these precautions, one or more fresh reactors were occasionally found at the half-yearly tests. The causes of these new infections were eventually considered to be the rather close proximity of the reactor stable to the clean herd stable, there being only about two hundred yards distance between the two, and, although the care-taker of the reacting herd was forbidden to work in the clean herd stable, he was occasionally found there. This being the case, it was decided in the summer of 1918 to slaughter all reactors then present, and also any which subsequently reacted in the half-yearly tests. Accordingly, all reactors were slaughtered during the summer and tuberculosis varying in extent was found present in every case.

Unfortunately, owing to pressure of other work and lack of help, the fall test, 1918, was not made. In March, 1919, the test was carried out with tuberculin bought the previous fall from

Mulford. Thirty-eight cows and seven six-months-old calves were tested, the calves being given only three-fourths doses. All the cows had been negative in previous tests; the calves were being tested for the first time.

Reaction temperatures were obtained with five cows and six calves. This was a big surprise to the manager, as he was expecting to find the herd clean. The readings were submitted to us for consideration.

With the reacting cows the readings showed that the temperature curve did not begin to rise until fifteen hours after the injection and that in three instances the cows' temperatures had been 102° one hour before injection. The attendant considered that some were in heat and consequently should not have been tested. The rise in temperature above the highest pre-injection temperature varied from 2 to 5 degrees with the differnt animals.

With the reacting calves the temperature curve rose earlier, went higher and was maintained longer than with the cows, a good positive reaction being recorded in each case. The question was raised, were the calves too young, had too large a dose been administered, was the fact that they had been lively and restless responsible for the rise in temperature rather than tuberculosis? In view of these doubts regarding the reliability of the test, we recommended a retest to be made within a week of the first test, a double dose of the tuberculin to be injected.

On the third day after the original test the retest was made on all reacting or suspicious animals.

Of the six calves that reacted to the first test, all reacted strongly to the second. On slaughter five of the six showed well-marked tubercular lesions in the cervical glands, lungs and mesentery glands, and one of them had lesions in the liver; in one case no macroscopic lesions were observed. Stained smears made from the affected tissues showed typical acid-fast *Bacterium tuberculosis*.

Of the five cows that reacted to the original test only one reacted to the retest. This one was slaughtered and showed considerable tubercular involvement of the lungs, mesentery glands, cervical glands and peritoneum. Clinically, however, the cow had looked to be in excellent condition.

Appended are the temperature readings of calves and cows that were retested, both test and retest being recorded.

	P. M.				A. M.			P. M.	
	2.45	4.45	7.45	8.45	8.30	10.00	11.30	1.00	2.30
	°	°	°	°	°	°	°	°	°
Calf No. 1, Test	103	101	103	102	102	101	105.3	105.2	105
Retest	100.2	101	101.1	101.1	105.3	105.3	106	105.3	105.1
Calf No. 2, Test	101	101.2	102	102	102.2	102.4	105	105.4	105.3
Retest	101.2	101.4	101.2	101.2	104.4	105.1	106.1	105.2	105.2
Calf No. 3, Test	101	101	101	101	103.1	105.3	106	105.2	104.4
Retest	100.3	100.3	101.1	100.4	100.2	103.1	104.3	105.4	105
Calf No. 4, Test	101.4	101.4	101	101	101	101.2	102.2	104	104.3
Retest	100	100.3	101	100.3	102	103	104.4	104.2	103.4
Calf No. 5, Test	101	100.4	101.2	101.2	101.3	101.1	105	103.1	104
Retest	100.3	101	101.2	101.3	102	103	106.1	103	102.3
Calf No. 6, Test	102	102	102.3	102	102.2	103.2	105.2	105.3	105.3
Retest	101.3	102	102	101.4	104.3	105.2	105.3	105.1	104.1
Cow No. 1, Test	101	101.3	102	101.4	102.3	102.3	104.4	104.4	105.2
Retest	101.1	101	101.2	101.1	102.2	102.2	102.1	102.1	102.2
Cow No. 2, Test	101.3	101	101.2	101.1	101.1	101.4	102	103	104.4
Retest	100.2	100.3	101.1	100.3	102.1	102.1	102.2	102.4	102.1
Cow No. 3, Test	101.3	101.1	102	101.1	101.3	102	103	103.3	104.2
Retest	100.3	101.3	100.4	100.3	101.1	101.1	101.1	101.4	101.2
Cow No. 4, Test	101	101	101.1	100.4	101.4	102.1	103	104	106
Retest	101	101.1	100.2	100.1	101.2	102	102.2	102.2	102
Cow No. 5, Test	101.1	101.3	102	101	101.2	101.3	102.2	103.3	104
Retest	101	101	100.3	101	101	101.4	103.1	104.3	104.2

A TERRIBLE TIMELY TALE.

Mason City (Iowa) Globe Gazette.

Charles City, Iowa, May 22.—Seven years ago a farmer living west of this city hung his vest on a fence in the barnyard. A calf chewed up a pocket of the garment in which was a standard gold watch.

Last week the animal, a staid old milch cow, was butchered for beef and the time-piece was found in such a position between the lungs of the cow that the respiration—the closing in and the filling of the lungs—kept the stem-winder wound up and the watch had lost but four minutes in the seven years.

Lieutenant Orin H. Crossland, who has been on foreign service with the 88th Division, A. E. F., for the past year, has returned to his home in Athens, Ill., and resumed his practice.

ABSTRACTS.

"INJURED INNOCENCE."

A WELCOME TO OUR COLLEAGUES RETURNING FROM THE CAMPAIGN.

R. v. OSTERTAG,
Zeitschrift für Fleisch und Milchhygiene,
Vol. 29, p. 57, 1918.
(Translated by William N. Berg, Washington, D. C.)

With what noble inspiration, with what pride in not needing to remain at home, did all of us, man for man, hurry to the flag in August, 1914, in order to assist in protecting the threatened Fatherland from the enemy! How we have shared sorrows and joys with our comrades from all other callings in civil and military life; in those who had not come in contact with veterinarians an interest in our calling has been awakened and an equality for which we have frequently struggled in vain at home has been attained through this community of sorrow and joy. This and the fact that our Army places honorable reliance in the right of suffrage, are the beacon lights in the struggle just ended. Otherwise, during the four years of the struggle against almost the entire world our Fatherland was overflowing with sorrow and affliction. The fearful terrors of the present war, the sorrows for beloved comrades whom the war devoured, the exhausting worry of the intelligent as to whether Germany can be equal to the newly arising enemies, lastly the United States, with its inexhaustible industrial resources; finally crushed, the man, who like a hero, resisted to the last. And how sorrowful the end! After four years of most heroic and successful struggle against a coalition the like of which the world has not seen before, the downfall occurred only through the concurrence of a series of circumstances arising out of the four year privations at home and in the field. The misfortune is great, but greater is the courage to bear it. You who were in the field until now, return home as heroes, like those who because of wounds or sickness were compelled to seek their homes for recovery. You shall be welcome as heroes and shall be greeted as such upon your home return. May all those who remained home because they could or were obliged to do so, exert themselves in helping you to civil activity and to the reconstruction of all that you have lost during

your absence. In the difficult mountains in Swabia, where human beings are nearer to one another than in the more comfortable plain and city, there is a pretty custom, that everyone who sets up a household is voluntarily assisted by the entire community, so that he may soon have a protecting roof and be able to light a fire in his own hearth. So may all help our colleagues returning with the shield from the field, so that they may be compensated to some extent for what they have achieved and suffered for their home. Be welcome home to work of peace, to the rebuilding of your home life and to the sorely afflicted Fatherland.

RECONSTRUCTION.

R. v. Ostertag,
Zeitschrift für Fleisch und Milchhygiene,
Vol. 29, pp. 58-59, 1918.
(Translated by William N. Berg, Washington, D. C.)

After four years' struggle, to which history knows no parallel, Fate has decided against us. In spite of all the sacrifice in blood and fortune, offered so abundantly by the German people during the four years of war; in spite of the unspeakable privations suffered by the homefolk; comes now as the end of it all the prospect of the burden to be borne by the undismayed people. The conditions of the armistice which our opponents have forced upon us give us a foretaste of what ruthlessness, drunk with victory, would impose upon an undefeated and indomitable people. The thought arises that in such a peace not the slightest trace of justice is perceptible and it can furnish no foundation for the mutual understanding between all peoples that are entitled to be classed as cultured—people nor their union by a league of nations toward which our opponents are alleged to be striving.

It is a sad occurrence that the opposing world denies to Germany that respect never denied a brave opponent. And to this respect Germany, who for four years fought against the whole world's human material and industrial production with the heroism of antiquity; whose people suffered for four years for the Fatherland as no people have ever suffered before, has every claim. The opponents' methods of calumny and instigation through senseless tales of horror have apparently misled foreign thought more than we expected from the evident untruthfulness of the enemy's inflammatory press. All these are the woeful conditions at the end of a long war of sacrifice and privation.

But misfortune is not changed by complaint, one is not freed by it. We must courageously assume the heavy burdens of the unfortunate war and resolutely grasp the work of reconstruction with the consciousness that on this earth nothing is permanent except Change and happier days must again follow misfortune.

This is true of the entire people and of us veterinarians in our fields of activity. The practicing veterinarians whose practices have disappeared and savings wasted entirely or in part must courageously begin again at the beginning, supported happily and effectively, let us hope, by all those who were obliged to remain at home during the war. For all of the others who occupied official positions at the outbreak of the war, the provision has been made that these positions be held open to the participants.

In a material way, in the narrower fields of meat inspection and milk control, it is our duty to begin that which, because of scarcity of veterinarians, had to be diminished or discontinued entirely; to gradually restore the previous order; especially the complete veterinary inspection in public abattoirs, the supplementary inspection in the open country; the filling of vacancies for veterinarians in meat inspection positions in order to enable them to settle in places where an existence is not possible without the support of meat inspection. The more diffuse settling of the country by veterinarians is to the general interest, for in order to rebuild our animal industry, so heavily damaged by the encroachments of the war, it is absolutely necessary to have better veterinary service than was possible during the years of war.

I need but mention the great losses of hogs through erysipelas during the war, which made more difficult the already serious food situation; the numerous cases of emergency slaughter of valuable cattle, to which the owners were obliged to resort because veterinary assistance was not available.

Knowing that during the war the available supply of beef cattle and meat must be handled with greatest economy, the meat inspection regulations were so modified and rationally applied that only meat that was really detrimental to health was condemned; and all the rest permitted for use. Such a reasonable practice of meat inspection must be the guiding principle of the expert entrusted with the task of meat inspection. Stricter procedures in cases of defects which are only defects of appearance, where the judgment is left to the discretion of the expert, may be again resumed after the heavy task of rebuilding our herds is

crowned with success. To coöperate is the duty of all veterinarians. Whatever can be used without detriment as food must be made available for human nutrition; all the rest must be rendered useful in obtaining food by being rendered harmless and fed to animals (swine).

The importations of beef cattle and foreign meat, which were interrupted during the war, shall be facilitated, in order that as much nutriment as possible shall be rendered available to the suffering people whose health has been affected by years of undernutrition.

For the repletion of our herds, we need feeds which up to the present time have not been available. Through economy in handling meat, to which must be added the most thorough utilization for human nutrition of all suitable meat, we diminish the inroads upon our herds. Through a most thorough utilization of abattoir by-products in feeding hogs—a universal duty—we spare beef cattle which at present bear the entire load of providing meat; and keep cows whose milk for children, women, the aged and sick, for whom it is a most important, because indispensable, article of diet.

So may everyone work at his part of the severe labor of reconstruction; then, after years of courage and labor, sunny days may again be allotted to us.

Post nubila Phœbus!

A CASE OF HEART DISEASE WITH COMPLICATIONS IN THE HORSE.

(Di un caso di vizio di cuore combinato nel cavallo.)

F. LENZI.
Il Moderno Zoolatro. Parte Sci. Ser. V., Vol. VII, No. 12. December, 1918. Pp. 257-264.

This case is reported, not because of its rarity, but because the clinical manifestations did not give clear indications of the pathological lesions discovered on post-mortem examination.

A 15-year-old horse, suffering from epizoötic lymphangitis in a very emaciated condition, presented certain irregularities of circulation and respiration. There was evident dicrotism of respiration and symptoms of emphysema. The pulse was slow, soft, and full, with a certain amount of irregular intermittence, and was visible in the jugular vein. Percussion revealed a restricted cardiac area, consequent upon the pulmonary emphysema. There

was a rough systolic as well as a presystolic murmur. On rectal examination a dilatation of the aorta could be detected.

The clinical signs seemed to point to stenosis of the aorta and relative insufficiency of the tricuspid valve, or aortic insufficiency.

On post-mortem examination the heart, which weighed 3.4 kilogrammes, was enlarged, and the pulmonary artery and aorta were markedly dilated. The wall of the right ventricle was slightly hypertrophied and its cavity considerably dilated. The endocardium, the tricuspid and semilunar valves were normal. The right atrium was dilated, with thinning of its wall. The wall of the left ventricle was considerably thickened (maximum thickness, 5.2 cm.), and its cavity slightly smaller than normal. The endocardium was the seat of a chronic inflammation, which involved the mitral valve and, in a greater degree, the segments of the aortic valve, which were retracted, rugose, and studded with small nodules. The wall of the aorta was thickened and more resistant than normal. Some centimetres from its origin the aorta contained a piriform, pedunculated, mobile tumor of the size of a bean. The lungs were markedly emphysematous.—*Vet. Rev.*

RHINOSTOMY: A NEW OPERATION IN CASES OF PARALYSIS OF THE NASAL DIVERTICULUM.

(Della rinostomia: nuovo intervento operatorio nei casi di paralisi delle false narici.)

F. Cinotti.
Il Nuovo Ercolani. Vol. XXIII, No. 22. November, 1918.
Pp. 273-278. 2 Figures.

Paralysis of the "false nostril" is usually to be regarded as one of the symptoms composing the syndrome proper to paralysis of the seventh cerebral nerve. Functionally, however, the nasal diverticulum stands in only minor importance, in respect of lesions, as compared with the ear, eyelids, jaw, and lips; and it is only in cases of complete diplegia that lesions are of semiological value, and because of obstruction to respiration of preponderating importance. Nevertheless, paralysis of the nasal diverticulum may exist alone, though certainly rarely as a unilateral lesion, and very rarely as a diplegia. The condition may be the result of traumatism.

The author has devised an operation whereby the obstacles to respiration (inspiration) produced by paralysis of the "false nostril" may be removed. The operation, for which the name *rhinostomy* is suggested, consists in the formation of a permanent opening into the diverticulum from the exterior. The animal is cast, a local anæsthetic and adrenalin is applied, and, from within, an incision of the lining of the diverticulum, 7 to 8 cm. long, is made so as to bisect the angle described by the free borders of the nasal and incisive bones, beginning about 2 cm. from the apex of the angle and passing forwards from this point. The inner lining of the lateral wall of the diverticulum is carefully freed by means of curved scissors. A similar incision is made through the external skin; the fibro-cartilaginous prolongation of the nasal cartilage (alar fold?) is liberated and amputated at its base, and the external skin and the inner lining of the "false nostril" are stitched together.—*Vet. Rev.*

Tick eradication is still assuming large proportions and the monthly dipping records require from six to seven figures to tell how effectually the various southern states are striving to forever eliminate the dreaded cattle tick.

The month of May, 1919, shows the following number of cattle dippings in the states indicated:

Alabama	1,014,684
Arkansas	695,554
Florida	352,809
Georgia	528,080
Louisiana	1,774,341
Mississippi	532,558
North Carolina	8,422
Oklahoma	612,999
South Carolina	155,487
Texas (north)	1,227,591
Texas (south)	316,679

The creation of the first veterinary scholarship in the name of an honored professor, now known as the James L. Robertson scholarship, at the New York State Veterinary College, New York City, was awarded to a New England student.

A second scholarship at the Veterinary School at New York University is under way to memorialize the name of the late Dean William J. Coates, an alumnus, professor and dean for nearly twenty years of that Veterinary School.

ARMY VETERINARY SERVICE.

FROM THE OFFICE OF THE SURGEON-GENERAL OF THE ARMY, WASHINGTON, D. C.

TRANSFERS AND ASSIGNMENTS OF VETERINARY OFFICERS.

1. Major George H. Dean, V. C., from A. R. D., Camp Wheeler, Ga., to A. R. D., Camp Meade, Md., for duty as The Vet'n.

2. Major Robert C. Musser, V. C., from duty as Camp Vet'n, Camp Lee, Va., to Walter Reed General Hospital, Washington, D. C., for observation and treatment, at the expiration of 3 months' sick leave.

3. Major Chas. H. Jewell, V. C., U. S. A., who has just returned from overseas, where he was assigned as Chief Vet'n, 9th Army Corps, has been directed to report to the Surgeon General of the Army for temporary duty in his office.

4. Major E. W. Hogg, V. C., from duty at Camp Dix, N. J., to Washington, D. C., for temporary duty in the office of the Surgeon General. Major Hogg has just returned from overseas, where he has been serving as Division Vet'n, 79th Division.

1. Captain Edward J. Williams, V. C., from Camp Logan, Texas, to Camp Custer, Mich., for duty as Camp Vet'n.

2. Captain Will C. Griffin, V. C., from Camp Harry J. Jones, Douglas, Ariz., to Camp Fort Bliss, Texas, for duty as Camp Vet'n.

3. Captain Thomas S. Hickman, V. C., from A. R. D., Camp Shelby, Miss., to A. R. D., Camp Kearny, Calif., for duty as The Vet'n.

4. Captain N. M. Crawford, V. C., from duty at Chicago, Ill., to Presidio of San Francisco, Calif., for duty as The Vet'n.

5. Captain P. F. Galloway, V. C., from duty at A. R. D., Camp Hancock, Ga., to A. R. D., Camp Funston, Kan., for duty as The Vet'n.

6. Captain G. B. Huse, V. C., from duty at Camp Veterinary Hospital, Camp Lee, Va., to Camp Lee, Va., for duty as Camp Veterinarian.

7. Captain J. L. Hartman, V. C., from duty at A. R. D., Camp MacArthur, Texas, to Chicago, Ill., for instruction in meat inspection.

8. Captain Jerry L. Ruble, V. C., from A. R. D., Fort Bliss, Texas, to A. R. D., Camp Gordon, Ga., for duty as The Vet'n.

9. Captain C. C. Whitney, V. C., from duty at Dept. Laboratory, Cen. Dept., Fort Leavenworth, Kan., to Fort Sam Houston, Texas, for duty in Dept. Laboratory, that station.

10. Captain J. J. Essex, V. C., from present duty at Camp Meade, Md., to duty as Camp Vet'n, that station.

11. Captain H. H. Beeman, V. C., from Camp Meade, Md., to A. R. D. 318, Camp Sherman, Ohio, for duty as The Vet'n.

12. Captain O. J. Counzelman, V. C., from Camp Custer, Mich., to Fort Robinson, Neb., for duty as The Vet'n.

13. Captain Joseph E. Hodge, V. C., who has just returned from overseas, where he served as Division Vet'n, 29th Division, has been ordered to Camp Benning, Ga., for duty as The Vet'n.

14. Captain Fred D. Green, from Camp Dix, N. J., to Kelly Field, San Antonio, Texas, for duty as The Vet'n.

1. 1st Lieut. J. P. Gerety, V. C., from A. R. D., Camp Sevier, S. C., to A. R. D., Camp Upton, N. Y., for duty.

2 1st Lieut. W. E. Campbell, V. C., from A. R. D., Camp Shelby, Miss., to A. R. D., Fort Bliss, Texas, for duty.

3. 1st Lieut. M. L. Cline, V. C., from duty, A. R. D., Camp MacArthur, Texas, to Chicago, Ill., for instruction in meat inspection.

4. 1st Lieut. G. H. Conn, V. C., from A. R. D., Camp Zachary Taylor, Ky., to A. R. D., Camp Sherman, Ohio, for duty.

5. 1st Lieut. J. G. Fuller, from duty with the 8th Cavalry, Marfa, Texas, to Big Bend District, Marfa, Texas, for duty as The Vet'n.

6. 1st Lieut. S. A. Kamis, V. C., from A. R. D., Camp Bowie, Texas, to A. R. D., Camp Travis, Texas, for duty.

7. 1st Lieut. O. E. Gladfelter, V. C., from duty at Chicago, Ill., to San Juan, Porto Rico, for duty as The Vet'n.

8. 1st Lieut. E. C. Martindale, V. C., from Camp Veterinary Hospital, Camp Lee, Va., to A. R. D., Camp Lee, Va., for duty.

9. 1st Lieut. R. E. Oliver, V. C., from Camp Dix, N. J., to Newport News, Va., Port of Embarkation, for duty.

10. 1st Lieut. F. H. K. Reynolds, V. C., from duty at Dept. Laboratory, Southeastern Dept., Fort McPherson, Ga., to Fort Leavenworth, Kan., for duty in Dept. Laboratory, that Post.

11. 1st Lieut. W. L. Herbert, V. C., from A. R. D., Camp Meade, Md., to Fort Clark, Texas, for duty with the 13th Cavalry.

1. 2nd Lieut. C. W. Barrett, V. C., from A. R. D., Camp Kearny, Calif., to A. R. D., Fort Bliss, Texas, for duty.

2. 2nd Lieut. G. W. Rawson, V. C., from A. R. D., Camp Wheeler, Ga., to A. R. D., Camp Travis, Texas, for duty.

3. 2nd Lieut. R. S. Whitney, V. C., from A. R. D., Camp Sevier, S. C., to A. R. D., Camp Upton, N. Y., for duty.

4. 2nd Lieut. J. R. Houchins, V. C., from Camp Holabird, Md., to Camp Bragg, N. C., for duty as Assistant to the Camp Vet'n.

5. 2nd Lieut. O. C. Schwalm, V. C., from A. R. D., Camp Shelby, Miss., to Camp San Fordyce, Texas, for duty.

6. 2nd Lieut. F. R. Pettys, V. C., from A. R. D., Camp Shelby, Miss., to Hachita, N. M., for duty with the 12th Cavalry.

7. 2nd Lieut. J. S. Davis, V. C., from Camp Sherman, Ohio, to Camp Zachary Taylor, Ky., for duty as assistant to the Camp Veterinarian.

8. 2nd Lieut. R. T. Seymour, V. C., from A. R. D., Camp Hancock, Ga., to Fort Clark, Texas, for duty at that Post.

9. 2nd Lieut. H. Shreck, V. C., from A. R. D., Camp Hancock, Ga., to A. R. D., Fort Sill, Okla., for duty.

10. 2nd Lieut. F. J. Resmenyder, V. C., from duty with U. S. Troops, San Juan, Porto Rico, to Chicago, Ill., for duty at U. S. General Hospital No. 32.

11. 2nd Lieut. J. Nichols, V. C., from Camp Veterinary Hospital, Camp Lee, Va., to A. R. D., Camp Lee, Va., for duty.

12. 2nd Lieut. M. E. Norman, V. C., from A. R. D., Fort Bliss, Texas, to Marfa, Texas, for duty with the 8th Cavalry.

13. 2nd Lieut. T. W. Sprosser, V. C., from Camp Dodge, Iowa, to A. R. D., Camp Funston, Kan., for duty.

14. 2nd Lieut. A. F. Malcolm, V. C., from A. R. D., Camp Funston, Kan., to A. R. D., Camp Meade, Md., for duty.

15. 2nd Lieut. C. A. Moore, V. C., from A. R. D., Fort Bliss, Texas, to Fort Bliss, Texas, for duty with the 5th Cavalry.

16. 2nd Lieut. E. K. Rogers, V. C., from A. R. D., Camp Lewis, Wash., to Fort Robinson, Neb., for duty.

17. 2nd Lieut. T. R. Boyer, V. C., from Camp Dix, N. J., to Marfa, Texas, for duty with the 8th Cavalry.

18. 2nd Lieut. L. E. Miller, from Camp Dix, N. J., to Front Royal, Va., for duty as Assistant to The Vet'n.

19. 2nd Lieut. J. W. Morgan, V. C., from duty at Chicago, Ill., to Camp Lewis, Wash., for duty as Assistant to the Camp Vet'n.

Major Wm. Reid Blair, V. C., was honorably discharged from the Veterinary Corps, May 31, 1919.

Major Blair was commissioned in the Veterinary Corps on November 28, 1917, ordered to temporary duty in the Surgeon General's Office on December 19, 1917, and on December 22 was ordered to Camp Lee, Va., for the purpose of organizing advanced Veterinary Hospital No. 5 for duty overseas. This hospital was composed of 311 enlisted men and seven officers.

After a period of training at Camp Lee and Camp Hill, Major Blair and his organization sailed from Newport News on May 9, 1918, landing at St. Nazaire, France, the latter part of May, 1918. Immediately after landing, his hospital was assigned to duty at Auxiliary Remount Depot No. 1, Base Section No. 1, at St. Nazaire. Finding no adequate facilities here for quarantine and hospital treatment of the large number of animals suffering from strangles, influenza, pneumonia, etc., a series of barracks occupied by French Colonial Troops were obtained from the French authorities, and after these were vacated the barracks

were converted into a model hospital. This hospital was located about three-quarters of a mile from the Remount Station, so that all contagious or infectious diseases were removed from the Remount Depot. After the hospital had been in operation two months, it was visited and inspected by the Commander-in-Chief of the A. E. F., with a number of his staff. The arrangement of the hospital and the work of the organization were highly commended by General Pershing.

On August 1, 1918, Major Blair with his organization was ordered to the Headquarters of the 3rd Army Corps, with station at Mezy-on-the-Marne, for the purpose of assisting in the evacuation of animals during operations in that vicinity.

On August 22, Major Blair with Hospital No. 5 was ordered to the Headquarters of the 4th Army Corps located at Toul. Here, he was assigned as Corps Veterinarian of the 4th Army Corps, and the command of Veterinary Hospital No. 5 taken by Major Nelson.

In his capacity as Corps Veterinarian, Major Blair organized the veterinary service preparatory to the 4th Corps' participation in the St. Mihiel drive during September 12th to 14th. The veterinary service of the evacuation of animals during this drive received the commendation of the Corps Commander, General Dickman.

On Major Blair's recommendation, a number of concrete dipping vats for the prevention and treatment of mange were established throughout divisional areas so that animals could be treated without evacuating them to the hospitals in the rear. This method of treatment was highly successful and met with the hearty approval of the organization commanders who were universally opposed to the complete evacuation on account of no replacements being available during this period.

After the Armistice, Major Blair accompanied the Headquarters of the 4th Army Corps when it became a part of the Army of Occupation in Germany, finally locating at Cochem, Germany, where he remained until relieved by Major English and ordered to the U. S. Major Blair reached the U. S. May 22 on the S. S. "Imperator." Upon his arrival in the U. S., he was ordered to the office of the Surgeon General for report and was discharged May 31, 1919.

Major Blair expressed himself as having enjoyed the Army and as having received the very best kind of coöperation during his service in the A. E. F. Having commanded both veterinary hospitals and the veterinary services of Corps Troops, it enabled him to gain a very wide and valuable experience, and his views on reorganization and the needs of a properly-organized veterinary service have been greatly appreciated.

Major Albert M. Towner, V. C., U. S. A., was honorably discharged from the Veterinary Corps, U. S. Army, on May 31, 1919.

He was commissioned Captain, V. C., N. A., November 22, 1917; reported for duty with the 27th Division at Spartanburg, S. C., December 29, 1917, and assigned to the 54th Infantry as Brigade Veterinarian. On January 24, 1918, he was made Division Veterinarian, 27th Division, when he organized the Divisional Veterinary Service.

Captain Towner sailed with the Division from United States, May 18, 1918, and arrived in France on May 30. Upon arrival in France, the Division proceeded into Belgium, where it served with the British forces in that sector. While there, the Division took part in the Ypres-Lys offensive. It stayed in Belgium until the first week in September, when it proceeded to the sector between Cambrai and St. Quentin, where it took part in the Somme offensive, crossing the Hindenburg line at Bellicourt, September 29, 1918.

Captain Towner was promoted to the grade of Major on August 23, 1918, while he was Division Veterinarian, 27th Division. On October 19, 1918, Major Towner was transferred to the 3rd Army Corps as Corps Veterinarian and remained with this Corps until February 1, 1919, when he was transferred to the American Embarkation Center, Le Mans Area, as Chief Veterinarian. On April 23 he was relieved from duty at the Embarkation Center and ordered to the United States for discharge, leaving Brest on May 15 and arriving in the United States, May 28.

Upon arrival in the United States, Major Towner was ordered to the Surgeon General's office for consultation with the Veterinary Division. He offered some very valuable suggestions regarding the veterinary service, based upon his war experiences.

Major Towner has applied for a commission in the Veterinary Section, Officers' Reserve Corps, and is very optimistic for the future of the veterinary service.

Major Charles E. Clayton, V. C., U. S. A., was honorably discharged from the Veterinary Corps, U. S. Army, on June 4, 1919.

Major Clayton was commissioned in the Veterinary Corps, National Army, November 28, 1917, reporting at Washington, D. C., December 27, 1917, and assigned to the 3rd Division, Camp Greene, N. C., as Division Veterinarian, January 14, 1918.

Division Headquarters sailed from Hoboken, N. J., for overseas service March 31, 1918, and arrived at Bordeaux, France, April 5. The Division immediately proceeded to Chautevillain Training Area, where it underwent a period of intensive training until May 31, 1918, when it was ordered to the Advance Zone in the Chateau-Thierry District, where it entered into active operations that lasted until about July 28, 1918.

On June 28, 1918, Major Clayton was relieved as Division Veterinarian, 3rd Division, and ordered to the S. O. S. as Veterinary Inspector of Veterinary Hospitals and Remounts, with

station at Tours. On August 25, 1918, he was made Corps Veterinarian, 5th Army Corps, stationed at Ben-Noit-Vaux, where preparations were being made for the San Mihiel drive. The Division took an active part in this drive, which was immediately followed by the Meuse-Argonne campaign, from September 25 to November 11, 1918. The 5th Army Corps was ordered to the training area at Nogent-en-Bassigny on November 22, 1918, and when orders were issued for the disbandonment of this corps and return to the United States, February 10, 1919, Major Clayton was transferred to the First Army Headquarters as Assistant Chief Veterinarian, A. E. F., with station at Bar-sur-Aube, reporting on February 24, 1919. The First Army Headquarters was officially disbanded on April 20, and Major Clayton returned to the United States with the Headquarters detachment of officers.

Upon his return, Major Clayton was ordered to Washington, D. C., for consultation with the Veterinary Division, Surgeon General's Office, where he has given most valuable information and assistance based upon his wide experience during the war.

OFFICERS, VETERINARY CORPS, UNITED STATES ARMY.

	On Duty May 11, 1919.	On Duty June 11, 1919.
Colonels	0	0
Lieutenant Colonels	2	5
Majors	75	74
Captains	173	193
First Lieutenants	462	430
Second Lieutenants	503	432
Total	1215	1126

VETERINARY CORPS PROMOTIONS, A. E. F.

The following Majors have been promoted to the grade of Lieutenant Colonel:

1. H. E. Bemis
2. L. A. Merillat, Sr.
3. Reuben Hilty

The following Captains have been promoted to the grade of Major:

1. J. B. Lentz
2. W. C. White
3. H. B. F. Jervis
4. R. W. Smith
5. W. F. Guard

The following 1st Lieutenants have been promoted to the grade of Captain:

1. E. S. Warner
2. J. E. Weigen
3. H. R. Wise
4. D. E. Sisk
5. J. H. Allen
6. J. J. Ash

7. H. V. Baker
8. E. E. Black
9. R. B. Bolton
10. J. D. Eastwald
11. M. S. Esslinger
12. C. M. Gilchrist
13. I. O. Gladdish
14. R. H. Glenn
15. F. B. Green
16. R. A. Halsey
17. J. I. Handley
18. W. H. Haskell
19. L. A. Hock
20. P. H. Hudgins
21. R. K. Knighton
22. L. E. Moore
23. T. F. O'Dea
24. H. E. Pitts
25. H. G. Vanderroest
26. B. C. Bridges
27. B. H. Dunkley
28. W. D. Odou
29. C. S. Parker
30. W. M. Weldishefer
31. H. P. Gill

The following 2nd Lieutenants have been promoted to the grade of 1st Lieutenant:

1. T. E. West
2. E. M. Rundahl
3. H. L. Ragsdale
4. E. L. Peck
5. B. C. Murty
6. F. F. McNeely
7. A. F. Meredith
8. J. M. Lloyd
9. E. P. McBane
10. L. J. Lewis
11. C. J. Lambert
12. O. I. Holloway
13. J. R. Grigsby
14. A. Freer
15. W. France
16. M. E. J. Evans
17. C. H. Doepel
18. F. Cross
19. F. E. Cleaver
20. F. E. Clark
21. F. E. Carroll
22. R. A. Branson
23. M. E. Agnew
24. John McBirney
25. C. A. Beall
26. D. S. Harper
27. W. H. Williamson
28. D. M. Smith

PROMOTIONS IN UNITED STATES.

2nd Lt. M. J. Harkins to grade of 1st Lieutenant.

1st Lt. W. H. Houston to grade of Captain.

The following officers have been discharged from the Veterinary Corps, United States Army, during the past month:

1. Captain Howard C. Gale, who was on duty as the Veterinarian at A. R. D., Camp Sevier, S. C.
2. Captain F. G. Kneup, who has just returned from overseas.
3. Captain R. H. Schrecengost, who has just returned from overseas.
4. Captain F. D. Bertram.
5. Captain A. Moore.
6. Captain I. Myers.
7. Captain Wm. Brod.
8. Captain W. M. Decker.
9. Captain A. E. Hasselbach.
10. Captain W. C. Pulsifer.

The following first lieutenants have been discharged during the past month from the Veterinary Corps, United States Army:

1. F. C. Roach
2. H. A. Wilson
3. J. F. Rogers
4. L. M. Friedline
5. C. D. MacCormack
6. O. S. Pruner
7. E. C. Hughes
8. W. H. Empey
9. O. H. Crossland
10. R. S. Montgomery
11. Wm. F. Nolechek
12. A. D. Kammer
13. G. C. Bevan
14. B. E. Carlisle
15. W. E. Spierling
16. E. R. Worley
17. G. W. Swanger
18. D. L. Procter
19. L. L. North
20. J. T. Connelly
21. J. C. Wheat

The following veterinary officers have resigned from the Veterinary Corps, Regular Army, during the past month:

1. 2nd Lt. Calvin H. Bennett.
2. 2nd Lt. John Von Henry Schantz.

The death of Captain Alexander G. Fraser, V. C., N. A., at Walter Reed General Hospital is reported.

The following second lieutenants have been discharged during the past month from the Veterinary Corps, United States Army:

1. O. H. Welf
2. H. F. Oelschlager
3. V. W. Myers
4. A. P. Sturrock
5. J. W. Herbott
6. J. M. Kerr
7. M. L. Brackbill
8. H. N. Eames
9. J. L. Franz
10. G. Gilbert
11. J. E. McCoy
12. Chas. Thigpen
13. L. B. Barber
14. A. E. Joseph
15. N. J. Pearce
16. A. J. Dickman
17. H. F. Lienhardt
18. C. C. Ettling
19. R. F. Smith
20. S. G. Lindsay
21. D. W. Nicholas
22. W. H. Hauer
23. H. B. Mitchell
24. G. L. Allen
25. E. S. Ring
26. E. E. Lang
27. C. P. Lunneen
28. A. S. Martin
29. J. C. Quinlan
30. C. H. Leavitt
31. G. A. Hazel
32. J. L. Barringer
33. T. G. Kenney
34. J. F. Kane
35. M. E. Norman
36. F. E. Allen
37. R. T. Renwald
38. L. P. Crowe
39. T. H. Howe
40. P. S. Christman
41. J. A. Jensen
42. W. G. Lashbrook
43. D. J. MacLeod
44. G. A. Tucker
45. C. E. Morford
46. C. C. Pemberton
47. H. P. Bonnikson

ASSOCIATION NEWS.

AMERICAN VETERINARY MEDICAL ASSOCIATION.

COMMITTEES MEET IN NEW ORLEANS.

A meeting of the committees of the Southeastern States Veterinary Medical Association and the Louisiana Veterinary Medical Association was held at the Grunewald Hotel, New Orleans, La., May 21, 1919, to perfect plans for the annual convention of the American Veterinary Medical Association.

The meeting was called to order by Dr. E. I. Smith, temporary chairman. A motion to make Dr. Smith permanent chairman, by Dr. Butler and seconded by Dr. Cary, was unanimously adopted. A motion followed nominating Dr. H. C. Hutchens as permanent secretary, which was seconded and unanimously adopted.

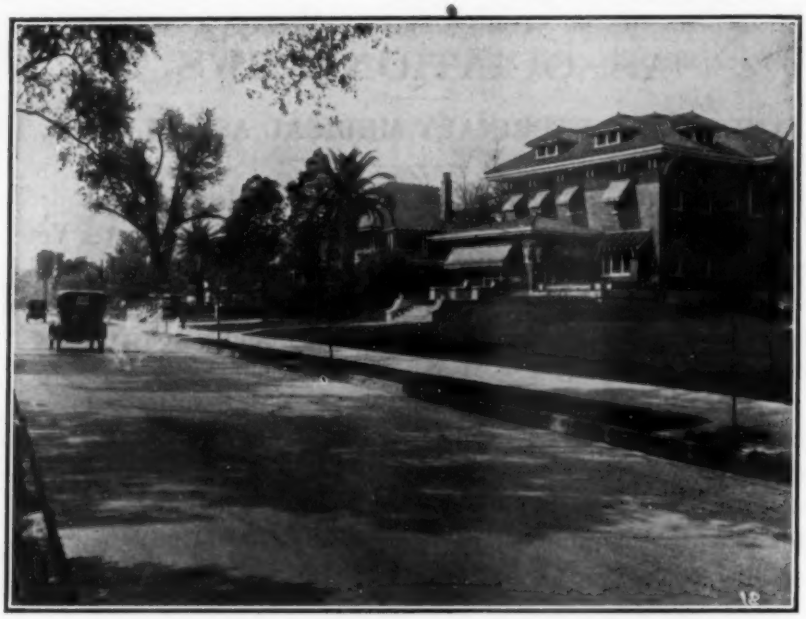
The committee on arrangements reported by Dr. Smith that the meeting will be held November 17-21, inclusive, with headquarters at the Grunewald Hotel. Space for the meeting has been secured on the twelfth floor of the hotel, the main assembly room having a capacity of seating 1,200 to 1,500 persons, with various other rooms on this floor for use of committees and secretary. Should it become necessary, two or more rooms can be opened into the main assembly room. From the general discussion of this subject it was apparent that adequate facilities, so far as space and hotel accommodations were concerned, had been arranged for.

The question of the disbursement of funds donated by the various state associations was thoroughly discussed, and, while no move was made for executive action, it was generally understood that the local treasurer, Dr. F. J. Cambon, would pay bills only upon voucher issued by the chairman of the finance committee, and at the close of the meeting itemized statements of disbursements would be rendered to each State Secretary donating for this purpose.

Entertainment for the members, and the ladies in particular, was thoroughly discussed and upon suggestion of Mr. Hill the following program was temporarily adopted:

First Night.—President's reception.

Second Night.—Open.



A Glimpse of St. Charles Avenue, New Orleans.

Third Day.—Luncheon and euchre party at Country Club for ladies.

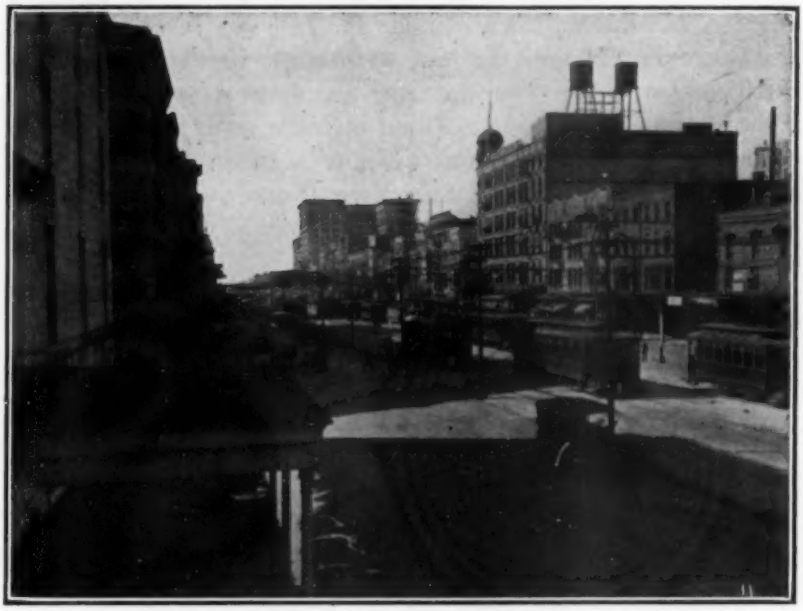
Fourth Day—Boat ride for all.

Dr. Cambon moved that the Secretary of this meeting write the various secretaries of the southern states associations and find out the amount they propose to donate and collect this amount, then suggest a joint meeting with the budget committee for action. Motion seconded by Dr. Flower. Carried.

Dr. Cary moved that the chairman appoint a budget committee and that this committee, after due consideration, confer with the entertainment committee for the program. Seconded by Dr. Cambon. Carried. The chairman appointed Dr. Tuck, Dr. Cambon and Mr. Hill.

At this time the question of a clinic was brought up by Dr. Cary, who was very much of the opinion that such should be arranged for. Dr. Smith stated that this subject had been fully discussed by the local committee, and it seemed, owing to lack of a suitable hospital, it was impossible to supply a clinic. However, after considerable discussion, it was agreed that the local committee would reconsider this subject, and, if possible, supply the clinic or something to take its place.

Dr. Cary moved that the Secretary of this meeting write each southern A. V. M. A. Resident Secretary and each secretary of



A Portion of Canal Street, New Orleans.

the southern states associations urging the necessity of a concerted effort on their part to secure new memberships at this meeting, that they search the woods for every available candidate for membership. Motion seconded by Dr. Flower and carried.

Dr. Cary moved that the present Chairman appoint a committee for the purpose of conferring and offering such suggestions as seem necessary relative to southern veterinarians on the program of the A. V. M. A. Seconded by Dr. Butler and carried. The Chairman appointed Dr. Cary, Dr. Flower and Dr. Dalrymple.

The question of securing railroad rates was brought before the committee, and as reported by Dr. Smith, this matter has to go through regular channels, which has already been started with every indication for success.

Publicity.—From the discussion of this subject it is quite apparent that this feature has been sadly neglected heretofore. In view of this fact, it was moved by Dr. Butler that a publicity committee be appointed, consisting of Drs. Dalrymple and Nesom and Mr. Seiferth, with stenographers and such facilities as necessary to carry out this move in a thorough manner, the expense of same to be paid for by the local finance committee out of the funds donated for such purpose.

Badges.—Reports so far show that nothing definite has been adopted, but during the discussion the fact was revealed that in Dr. E. Pegram Flower the profession has a member with a rare artistic talent. The Secretary was unable to describe what Dr. Flower gave a description of, but it made such a hit with the committee that its action was unanimous in that the Chairman appointed Dr. Flower as a committee of one to confer with the committee on badges and program, and recommends that his design be adopted.

There being no further business, a motion to adjourn by Dr. Tuck, seconded by Dr. Butler, was carried.

The following members of committees were in attendance:

Dr. F. J. Cambon, 303 Title Guarantee Building, New Orleans, La.

Dr. E. Pegram Flower, Box 24, Baton Rouge, La.

Dr. R. W. Tuck, 323 New P. O. Building, New Orleans, La.

Dr. C. A. Cary, Auburn, Ala.

Mr. T. J. Hill, Association of Commerce, New Orleans, La.

Dr. J. U. Upton, Donaldsonville, La.

Dr. E. I. Smith, Baton Rouge, La.

Dr. H. C. Hutchens, Atlanta, Ga.

Dr. Tait Butler, Memphis, Tenn.

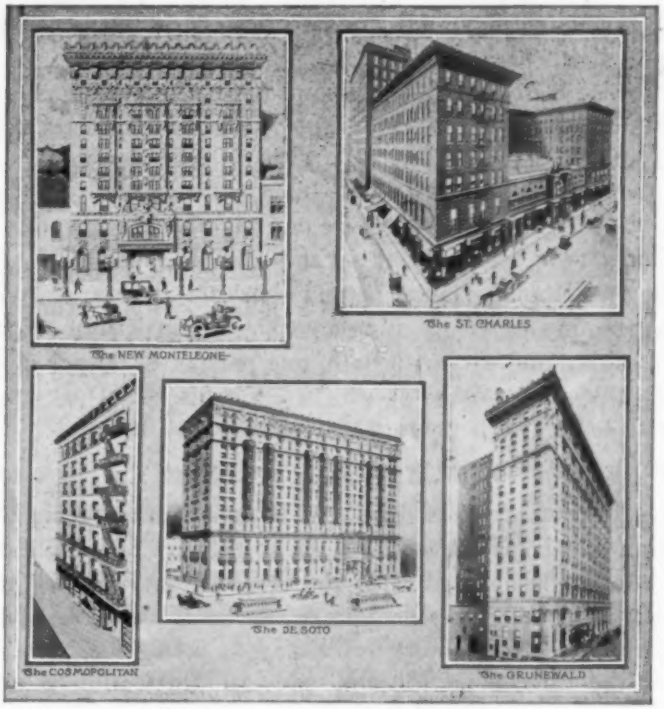
Dr. Albert W. Vornheder, 1150 North Carrollton Avenue, New Orleans, La. H. C. HUTCHENS, Secretary.

HOTEL INFORMATION.

In this issue it is much pleasure to present to the readers of the Journal two splendid views of New Orleans, including the residential and business section, together with a group picture of various hotels in the city.

Following is a list of the names of the hotels with detailed information which should be useful in case members decide to make comfortable reservations. In the event any member should desire to engage rooms in advance he is urged to do so at an early date, stipulating the occasion, how many will occupy the same room, and, if for ladies, due consideration will be extended relative to location and other conveniences.

Grunewald Hotel.—University Place, off Canal Street, 500 rooms. Headquarters for the A. V. M. A., November 17-21. Single room without bath for one person $1.50 per day, for two $2.50 and up; single room with bath for one person $3.00 per day, for two $4.00 and up. Double room without bath for one person



A Group of New Orleans Hotels.

$2.00 per day; for two $3.00 and up. Double room with bath for one person $4.00 per day; for two $5.00 and up.

St. Charles Hotel.—St. Charles and Common Streets, 500 rooms, 3 blocks from headquarters. Room occupied by one person, without bath, $2.00 to $3.50; with bath, $3.00 to $7.00. Two persons, without bath, $4.00 to $6.00; with bath, $5.00 to $10.00. Parlor, bedroom and bath, $10.00 to $25.00.

Hotel Monteleone.—Royal at Iberville Streets, 400 rooms, 3 blocks from headquarters. Single room without bath for one person, $1.50 per day and up; with bath, $2.50 per day and up. Double room without bath for two persons, $2.50 per day and up; with bath, $3.50 per day and up.

Hotel De Soto.—Baronne at Perdido Street, 300 rooms, 4 blocks from headquarters. Single room without bath, $1.50 per day and up; with bath, $2.50 per day and up. Double rooms without bath, $2.50 per day and up; with bath, $3.50 per day and up.

Cosmopolitan Hotel.—120 Bourbon Street, 100 rooms, 2½ blocks from headquarters. Single rooms without bath, one per-

son, $1.00 per day and up; with bath, $2.00 per day and up. Double rooms without bath for two persons, $2.00 per day and up; with bath, $3.00 per day and up.

Lafayette Hotel.—St. Charles and Lafayette Streets, 80 rooms, 6 blocks from headquarters. Single room without bath for one person, $1.50 per day and up; without bath for two persons, $2.50 per day and up; with bath, one person, $2.00 per day and up; with bath, two persons, $3.00 per day and up. Double room with bath (twin beds), $5.00 per day and up.

Planters Hotel.—Dauphine and Iberville Streets, 75 rooms, 3 blocks from headquarters. Single room without bath, one person, $1.00 per day and up; with bath, one person, $2.00 per day and up. Double room without bath, two persons, $2.00 per day and up; with bath, two persons, $3.50 per day and up.

RAILROAD RATES.

The question of reduced railroad rates is still receiving careful attention and members of the Association may feel assured that those who are delegated with the responsibility of negotiating with the railroads will continue to use every resource available to the end that satisfactory rates may be secured.

For the time being the Railroad Administration is authorizing one and one-third fares on the certificate plan, but is limited to certain organizations only, notably, fraternal, religious, educational, charitable, or military organizations, which would not include such meetings as the A. V. M. A. However, the Administration is confident that the usual winter excursion fares will be in effect during the time our Association is in session, but can not give definite information until about September or October. In the meantime, the members will be kept well posted regarding any new developments, but from the present indications it is firmly believed liberal concessions will be obtained. Therefore, all should decide, early, to attend, or, in other words, be in readiness to accept any good news in the form of rates, which always comes as an agreeable surprise. All aboard for the A. V. M. A.

E. I. Smith,
Secretary-Treasurer and Chairman,
Committee on Arrangements,
Louisiana Veterinary Medical Association.

OUR DUTY TOWARD CONSTRUCTION.

It is an undeniable fact that history frequently repeats itself. In many instances we sincerely hope not, but in some others we eagerly look forward to the time when it will *repeat* with greater force.

We have gone so far as to set the time and the place—New Orleans, November 17, 18, 19, 20, 21, 1919.

At the 50th annual meeting of the American Veterinary Medical Association, the majority expressed a desire that something definite should be done to trace in writing the half-century of progress made by the veterinary profession in America.

In the meantime, we are busy making history which will be placed at the disposal of some one richly endowed with epistolary gifts.

Let us do this energetically, definitely, sincerely and hopefully for the supreme dignity of the veterinary profession.

Each battle should be a decisive one, and each year the Association meets every member should ask himself, what have I done to help the profession have its achievements carved in imperishable letters on the facades of time?

The great conflict for democracy is over. For us, it lasted one year, seven months and five days, and in that time seventy-two thousand Americans died in France.

The veterinary profession generously contributed its share all for humanity and the eternal happiness of mankind throughout the world.

The history of the second fifty years of the profession will occupy a volume dedicated to the veterinarians who gave all and who served unstintingly that we might forever live in the golden atmosphere of "Peace on earth and good will toward all men."

We hope all the boys who wore khaki and so gloriously supported the cause of freedom will be home by November, and, moreover, will be attendants and participants at the 56th annual meeting of the A. V. M. A., November 17, 21, inclusive.

E. I. S.

PRESIDENT MOORE APPOINTED DR. KLEIN.

President V. A. Moore appointed Dr. L. A. Klein, Dean of the Veterinary School of the University of Pennsylvania, as a delegate to represent the American Veterinary Medical Association at the annual meeting of the American Association of Pharmaceutical Manufacturers held in Atlantic City June 2.

WORK ON THE PROGRAM.

Work on the program for the 1919 meeting of the American Veterinary Medical Association is already on the way. Dr. A. S. Cooley of Cleveland is chairman of the section on General Practice (medicine and surgery), and Dr. L. Enos Day of Chicago is chairman of the section on Sanitary Science and Police. We are anxious to provide an interesting and practical program. If any members of the association have anything they would like to present at this meeting we shall be glad to hear from them. Please advise either Dr. Cooley, Dr. Day or the Secretary. If you have something that will be interesting and helpful to the members, get it in shape as soon as possible. Every one must do his part and not "Let George do it."

NELSON S. MAYO,
Secretary.

THE SENSE OF HUMOR.

One of our good friends, a lady tall and very thin, exceptionally so, tackled a Mr. Murphy about his horse in her home town, not far from Boston. "Mr. Murphy," she said, "your horse is poor. If you don't feed him better I shall complain of you." "Miss B——, I do feed the horse, he gets nine quarts of oats a day and plenty of hay." "I don't believe you. Any creature that got enough to eat would look plump and fat." "Well, thin, Miss B——, it's mighty little ye're after gettin' yerself." That ended the conversation, but we saw that Mr. Murphy lived up to his reported ration for his horse.—Our Dumb Animals.

Captain E. R. Steel of the Army Veterinary Corps is now commanding officer for the American students who were at the Royal (Dick) Veterinary College at Edinburgh, Scotland. Captain Steel writes that he is taking a two months' post-graduate course, covering laboratory diagnosis in pathology and bacteriology from the practitioner's point of view. He says they will also get some work in making bacterins and in special milk and water examinations. There are thirteen American veterinarians taking this course. Captain Steel hopes to return to the United States some time in July, but as he says, "orders dictate one's whereabouts, mode of life, and existence." He also states that they have learned to appreciate America as never before.

OTHER ASSOCIATIONS

ASSOCIATION OF STATE AND PROVINCIAL VETERINARY COLLEGES.

REPORTS OF COMMITTEES.

Committee on Methods of Teaching Parasitology.

General Statement.

The members of the Committee on Methods of Teaching Parasitology have accepted the work delegated to them by our President, Dr. H. S. Murphey, with pleasure, but not without a keen appreciation that they were not wholly prepared to do full justice and credit to the problem. Each of the members of the committee has had experience in teaching Animal Parasites and has given to this report his best judgment in the light of his experience and general information. The members of the committee were agreed from the first that we should present a general comprehensive report to which we would all be willing to sign our names. We have succeeded in doing this in regard to every phase of the report with but one exception, which will be explained under the division of the subject designated symptoms and clinical differential diagnosis, diagnosis and treatment.

The fact that animal parasites are important as disease-producing agents has been known for a great many years. The amount of time given to the consideration and study of the question of parasitism, however, has varied greatly during different periods; at times it has been looked upon as one of the most important factors to be dealt with, while at other times it has received almost no attention, and parasites have been looked upon as more or less unimportant as disease-producing agents. As the necessity for the protection of our live stock from disease has grown, largely because of the general laws of supply and demand, and because of the rearing of animals, under more or less intensive conditions, and because of the modern commercial method of handling animals for food purposes, and because of the very general interchange of breeding stock, and because of the numerous stock shows, etc., there have been brought about conditions that make possible the spread of parasitic diseases; and thus parasites, as well as all classes of disease-producing agents,

have of necessity received attention. While the full importance of many animal parasites was not fully appreciated until more or less recent years, our knowledge regarding them has been gradually added to both as a result of natural infestations and experimental work, until today we have come to understand the very great importance of parasitism and animal parasites in relation to the cause and spread of disease among both man and animal.

Studies in parasitology, as strictly veterinary, have been introduced into practically all courses in veterinary medicine within the last ten or fifteen years. This, together with the great amount of work being done and the discussion that is taking place on the question of animal parasites, and the fact that the matter is up for consideration before this association, speaks sufficiently for the importance of this subject and the attention that it is receiving by the medical world.

The object of this report is briefly to outline a systematic plan for a method of teaching parasitology to veterinary students with the object of adequately covering the subject and at the same time of not encroaching upon the time which it seems essential to devote to other studies. This becomes a very difficult problem when we stop to consider *the large number* of animal parasites affecting the *different species* of *domestic animals* which must necessarily be covered or dealt with in a course in veterinary medicine. In that the subject can only receive its apportioned amount of time as related to other subjects in any given veterinary curriculum the general tendency to limit the number of credit hours a student can carry, and the introduction of new work in connection with the war, make it necessary for one teaching parasitology to be very careful in the *arrangement of the subject matter which is to be given.* This includes the laboratory work, the subject matter of the lectures, the selection of the parasites and organs to be used for study and demonstration in the laboratory work and the listing of references. In those cases where condensed and up-to-date material is not available for reading, the instructor should compile such material for the students with the object that a maximum amount of ground may be covered in a minimum time. Time may further be conserved by the use of drawings and charts in connection with fresh and preserved specimens studied in the laboratory by the study and comparison of tissue changes resulting from animal parasites with lesions due to other causes in all classes in path-

ology, and lastly by having the students make personal use of all the parasites and parasitic conditions met with in the animals that come under their observation in the clinic and post-mortem work. Such procedure is strictly clinic work, is supplementary to parasitology, and is the ideal way for a student to become familiar with all phases of a particular form of parasitism.

Preparation of the Student.

In taking up the subject of parasitology with veterinary students it is essential that they have had some general and fundamental work in zoology. The teacher must assume this. The work in general zoology given to veterinary students should be of such a nature as to familiarize them with methods of study, classification, life history, biological laws, morphology, and the general principles of zoology, including both vertebrates and invertebrates, in a way that would serve as a foundation to the principle of structure and function in anatomy and physiology, and to the study of the various forms of life parasitic to our domestic animals. If this suggestion were to be carried out, it would mean that the work in zoology offered to veterinary students in most of the departments of zoology in the various institutions in the country would have to be especially outlined for veterinary students, as any one of the various studies for beginners in zoology offered to students in other courses is too general, too limited in its scope and is arranged as one of a series of studies, one being prerequisite to the other. To overcome this difficulty the Department of Zoology at Iowa State College offers work in zoology to veterinary students complete in itself and outlined to meet as nearly as possible the special needs of the student pursuing work in veterinary medicine.

Classification of Animal Parasites.

Inasmuch as there seems to be no better way for veterinarians it is undoubtedly absolutely essential that we should classify and study animal parasites as they are classified in systematic zoology. The veterinarian should be able to place in its proper zoological position any known parasite. After the student has become familiar with the zoological grouping of the various forms he will be able when engaged in the practice of veterinary medicine to deal without confusion with parasites according to the species of animal attacked or according to the part invaded; for example, intestinal and lung parasites; but unless the individual con-

cerned is able to place the parasite under consideration in its proper zoological position, he will not make much progress in a scientific way. The proper classification of a parasite is, of course, more or less essential to diagnosis, treatment and prevention. The various forms of animal life to be dealt with in parasitology offer a very definite and characteristic morphology, as well as conform to definite biological laws; therefore, we would emphasize that the various forms of animal life found parasitic to our domestic animals should be looked upon as a group of disease-producing agents to be classified and studied as thoroughly and systematically as are microörganisms. When the student has completed the study he should look upon and have an understanding of animal parasites as comparable with that which would be expected of a student completing studies in pathogenic microbiology, or of a student of systematic and economic entomology.

The Ground to Be Covered.

The subject matter of the study of parasitology should be covered by means of lectures, laboratory work, demonstrations, and reference reading. The subject matter to be covered by lectures must, of necessity, be condensed, systematically arranged, and, while it should not include a species description of the parasite, it should include generic characters. The species description takes a great deal of time, and can be much better handled by being given in the form of a printed outline for use in the laboratory. For example, in taking up the ascaridæ, the lecture work would cover briefly the group, class, order, family and genus with a list of the different species. From this point the lecture work would include the question of ascariasis in all species of domestic animals as outlined later. The laboratory work should consist of an examination of the more important animal parasites with special emphasis on the morphology for purposes of identification, for an understanding of the injurious action of the parasite and those morpholgical structures which have to do with reproduction, life history and indirectly with methods for control. The laboratory work should further consist of demonstrations of gross specimens of the parasite and tissues showing lesion. In many cases histological preparations are indicated and all can be supplemented to good advantage by the use of charts, drawings, and lantern slides in the lecture room or laboratory. The reference reading assignment must be definite

and not require that a student read extensively to obtain a minimum amount of information.

The Scope of the Work.

The subject of parasitology as taught to veterinary students should include only those forms of animal life that are visible to the naked eye, except for the few cases cited below, or, in other words, it should not attempt to cover microörganisms, even though many such are in the animal kingdom. Realizing from experience that there will of necessity be some overlapping, it is to be counted as a gain to the student rather than a loss or unnecessary duplication; for example, piroplasma, trypanosoma, coccidia, sarcosporidia and all microscopic forms, even though they seem to have a protozoan relationship, should be dealt with in bacteriology or microbiology and only indirectly referred to in parasitology. A discussion on animal parasites to be complete must, of course, include the lower forms of animal life, but our point is, while we would in a general way and in our classification include the above microscopic forms, we would leave specific information and detailed study of these forms to the study of microbiology. On the other hand, acarina (Ex. demodex and laminisioptes cysticole), which require magnification to determine, should be looked upon as belonging strictly to parasitology. Local conditions as they exist in the various institutions might logically call for some variation in this regard.

Morphology.

The work in parasitology should be such as to familiarize the student with the morphology of the adult parasite, including external and internal structures, but especially such external markings as size, structure, etc., that will be useful in the identification of the parasite. Morphology should further include the organs of reproduction, eggs or ova, embryoes, larval and pupal forms, as well as the adult. In fact, any markings or structures, including all *stages* of *development characteristic* of different forms, that would in any way be of value in identifying the parasite or form of parasitism and that have a bearing on methods of control should be included.

Life History.

Since the control and eradication of animal parasites is largely a matter of prevention, it is essential that the student be familiar with every phase of the life history, including the atmos-

pheric and climatic conditions and geographical and geological formations favorable to their existence, continuation and spread. In taking up the life history of parasites we should start with the eggs, ova, and embryoes as they are formed or as they leave the adult, and trace them through their various stages of development and migrations as far as known until they have reached the host of the mature parasite and are again producing new generations. We must impress upon the student that the great advantage and often the only possible way to success in combating certain parasites is to direct our efforts at the stage of development most susceptible to destruction and that successfully and intelligently to carry this out we must be familiar with the *morphology* of *every stage* of *development* and the *complete life history* of the parasite. When considering the life history, the following points will necessarily come up for consideration:

(a) Is it necessary for the young to leave the host to complete its life cycle?

(b) By what channels and under what conditions are the young forms expelled from the body?

(c) What is the location in nature?

(d) Is an intermediate host necessary?

(e) What is the length of time and condition under which the young may remain outside the body of the host and still survive?

(f) How do the different forms gain entrance to the body?

(g) What are the different stages of development, metamorphosis?

(h) At what stage or stages is the parasitic action exerted?

(i) By what method does it become located in a particular organ or structure, its migrations in the body?

Action of the Parasite.

What is the parasitic effect of the parasite upon the host?

In what way is the particular species injurious outside its direct or strictly parasitic action?

Does the parasite carry infection directly or indirectly?

Lesions.

What structural changes and lesions resulting from the presence of the parasite, its method of feeding, its migrations, and forms of growth?

What lesions are typical of the parasite?

What is the pathology of the lesion after the parasite has left?

What must be considered in carrying out steps in the differential diagnosis of lesions?

Symptoms, Treatment and Prevention.

These are the points upon which there were slight differences of opinion in the committee as to just where the final word should be said. Some are of the opinion that these points should be covered in detail by the instructor giving the work in parasitology, while others are of the opinion that this phase of the subject should be dealt with in theory and practice (medicine). Granting that local conditions, especially in regard to the teaching staff of the different veterinary colleges, might call for some variation, it is generally felt that in some one study some particular instructor shall give in detail and emphasize the importance of the clinical symptoms. It would seem only logical that this should be left to the man teaching clinical medicine. In therapeutics and sanitary science, for example, we see no reason why other than mere mention of the form of parasitism to be dealt with is necessary. The students already have or will have information regarding parasites from their studies in parasitology. The instructor, for want of time, if for no other reason, must accept the student's information or assume that it will be acquired later; certainly, he should not attempt to give it. On the other hand, the time allowed to the study of animal parasites does not permit of a complete and thorough discussion of symptoms, treatment and prevention, and the man teaching the subject is, as a rule, not especially prepared to do this. Finally, it seems only logical that this should be dealt with by the teacher in theory and practice on the same basis that he would discuss the symptoms, treatment and prevention for other diseases.

The student following his completion of parasitology and of studies such as microbiology, physical diagnosis, therapeutics, and sanitary science should be prepared to take up in theory and practice and clinics every phase of parasitism, and should be able to understand and carry out methods of clinical diagnosis, prevention and treatment.

To summarize, the man teaching parasitology should cover all phases of the subject in more or less detail as outlined above, with the exception of the clinical symptoms, treatment and prevention. In the case of the latter the teacher of parasitology

will in many instances find that the symptoms and lesions are so connected and associated that they must be discussed together. Again, prevention is so completely dependent in many cases upon a thorough knowledge of the life history that in order to stimulate the student to the importance of knowing the life history, the fundamental principles of prevention must at least be mentioned. On the other hand, the teacher of the study, theory and practice (medicine) should take up and emphasize the *symptoms* of parasitic disease, the *treatment* and methods for prevention, and be held responsible for the final rounding out of the student's knowledge of this phase of the subject; in short, he should deal with these points the same as he does with identical points in other diseases. The teacher of theory and practice should take up any or all phases of parasitology that may help to make the diagnosis and treatment of individual cases and the handling of outbreaks practical and successful. He should give a general summary of all phases of the subject, and fix the important and essential points in the student's memory so that they will remain forever a useable part of his knowledge of diseases of domestic animals.

J. W. KALKUS,
A. G. G. RICHARDSON,
W. W. DIMOCK,
Committee.

COMMITTEE ON CLINICAL DIAGNOSIS AND SPORADIC DISEASES.

The subject assigned to your Committee on Clinical Diagnosis and Sporadic Diseases can not reasonably be considered in its entirety in one report, since it embraces separate and distinct lines of thought, each of which is worthy of special consideration. For this reason the report will be made in sections, consisting of a collaborate report on clinical diagnosis and another on teaching of sporadic diseases, prepared by Dr. J. N. Pringle.

Teaching Clinical Diagnosis.

A rather superficial investigation has caused your committee to assume that in most of the veterinary colleges of America the teaching of clinical diagnosis has been sadly neglected. In fact, it seems that in most instances it is not taught as a prescribed course but is practiced at the clinic for the benefit of students and generally by the "snap judgment" method. This

method inevitably portends disaster for the practitioner and must be looked upon as inexcusable in a modern system of pedagogy. The ability through knowledge and experience to correctly interpret symptoms of disease constitutes the very foundation of the practice of medicine and at all times distinguishes the scientifically trained devotee from the mere pretender. Why so little attention has been paid to the science of diagnosis is problematical. It seems to be one of those strange and seemingly unaccountable incongruities that have been revealed from time to time in our modern systems of education and which arise unexpectedly to mock and accuse us of pedagogic myopia.

It is a well-known and generally recognized principle that "practice makes perfect." In other words, proficiency in any line of human endeavor is invariably commensurate with the degree of thought and experience associated with it. The art of diagnosis rests upon the sciences which underlie it, but for correct interpretation must depend upon experience more than any other factor in correlating evidence, by giving proper weight to symptoms.

Symptoms of disease are observable deviations from normal physical conditions. In order to correctly observe, recognize and weigh the symptoms of disease, all of the faculties involved must be cultivated and this necessitates time and specialization in training. Diagnosis is the art of recognizing disease and in distinguishing one disease from another. In substance it is determining the symptoms and by deduction locating the diseased organ, defining the character and extent of the disease, and naming it in appropriate terms. It is doubtful if much credit should be given to the mooted claim of intuition in diagnosis which is not based upon a knowledge of anatomy, physiology, pathology and other fundamental sciences. The proficiency which a few have acquired in diagnosis is easily accounted for by their profound knowledge of the subject acquired by study and experience.

Before undertaking this report, your committee felt the need of information as to how clinical diagnosis has been taught in the state colleges of America, and to this end the following letter was addressed to each of them:

"The Committee on Diagnosis and Sporadic Diseases, appointed by the chairman of the Association of State and Provincial Veterinary Schools, wishes information on which to base its

report. There is a noticeable lack of method in presenting clinical diagnosis in some of our state and provincial veterinary colleges. In order that we may present this subject intelligently at our next meeting, it is quite necessary that we have your cooperation. To this end will you kindly answer the following questions or otherwise express your views on this important subject?

A—Do you favor a systematic outline of procedure in teaching diagnosis for hospital clinic and out clinic?

B—Will you favor us with an outline of the method you are using in presenting this subject?

C—To what extent are case reports made, filed and used subsequently for instruction or publication?

D—Should diagnosis in most cases be verified by special and specific laboratory tests?

E—Should special hours be scheduled for didactic presentation of the theory of diagnosis?

F—How much time should be devoted to clinical diagnosis and where in the course should instruction begin?

G—Please give us a brief outline of how in your opinion this subject can best be presented?"

From three colleges only were answers received which were helpful and which manifested a commendable interest in the matter. We find, however, that in the majority of colleges an out clinic is not undertaken. A few offer a free clinic, while others through deference to local practitioners, and for other reasons, are making a nominal charge for surgical cases and where treatment is prescribed. The majority of state veterinary colleges are located in cities of the second or third class, and have a small but varied clinic. Where the clinical material is limited it becomes necessary to use it to the best possible advantage and it seems certain that each case presented has possibilities for instruction which are not always utilized. For instance, after a general and special examination, infectious cases, and many that are not infectious, may be taken to the laboratories for specific examination of diseased tissue, secretions, excretions, parasites, or for bacteriological study. When the laboratory reports are handed to the clinician the case reports may be taken from the files, the laboratory and therapeutics reports added, and the case reviewed before the class. This procedure would be making the most out of clinical material in that it would lay before the student a comprehensive view of the case in its entirety; the final report of the results of the treatment given would lend an added interest, and the review of the case, with comments by the clinician, would certainly be worth while.

Recommendations.

A—A Systematic Procedure in Clinical Instruction.

An absolutely restricted outline of procedure for instruction in clinical diagnosis is not considered feasible because of the uncertainty and varied character of clinical material. However, a general scheme should be worked out to follow as closely as circumstances will permit. Instruction might be considered under four distinct phases:

1. The theory of diagnosis, given by a course of lectures or using a text such as Malkmus' Clinical Diagnosis. This work should begin with the sophomore year and continue as a two-hour subject for one semester.

2. The second semester of the sophomore year should provide for a two-hour laboratory period devoted to demonstrations. For this purpose normal animals should first be used and then for comparison. This period should be devoted largely to a study of symptomatology and for practice in the art of making physical examinations. In this way the various systems are thoroughly gone over and the student should become familiar with correct methods of examination. This course could perhaps be more appropriately given by the physiologist.

3. Beginning with the junior year and throughout the remainder of the course sufficient time should be provided each day to make the most out of all available clinical material. Students should be given diseased animals to work out their own diagnosis.

B—Clinicians.

To the end that students may profit by the knowledge and experience of all of the teaching staff it is especially recommended that all veterinarians of the faculty participate in the clinic. Infectious cases would naturally be assigned to a member of the bacteriological department, obstetrical cases to the obstetrician, parasitic cases to the professor of parasitology, etc.

C—Out Clinic.

Practice in clinical diagnosis being considered paramount, the hospital clinic should be supplemented by out clinic for higher classmen. This can be accomplished:

1. By taking groups of students to see cases in the city or adjacent country.

2. By encouraging students to spend their vacations as assistants to reputable practitioners.

3. By students seeing cases in company with local practitioners.

4. Giving a part of the course in a city where clinical material is abundant.

5. A few months' compulsory clinical tuition with reputable practitioners.

There are serious objections to all of these conditions and some of them, even though they could be accomplished, are not to be recommended. Conditions are not the same in any two instances and each college will need to work out its own problems. The problem of providing an ample clinic is a vital one and no class should be considered as fit candidates for graduation until it has had a most thorough training in the science and art of diagnosis.

D—Hospital Clinic.

Clinical work is naturally divided into two phases:

1. Didactic instruction and physiological practicums throughout the sophomore year.

2. General clinic covering the last two years and occupying not less than two hours daily. This includes (a) consultation clinic, or cases entering and available during the clinical period only, and (b) care of surgical and medical hospital patients.

The usual practice, and one which is recommended, is to assign cases to seniors with junior assistants. Students so assigned to see that the treatments prescribed are carried out and such attention given to their respective cases that they are prepared to give a full report of the same at a subsequent clinic period.

E—Clinical Reports.

Reports should be made each day and records kept of each case from the time that the case is entered on the hospital books. Printed forms should be used and filed for future reference. The accuracy, neatness, and completeness of these reports should be used in grading of students on this subject. The printed forms should provide for reports on:

1. Daily clinic records.
2. Surgical records.
3. Anesthetic records.
4. Diagnosis.

5. Remarks, where comments may be made and things of special interest recorded.

F—Departmental Correlation.

Correlation of departments to the end that one subject would be under consideration in all departments at the same time would be ideal but practically impossible. It is possible, however, to have a high degree of coöperation. For instance, if the circulatory system is under consideration in the clinic, class arrangements might be made for review of the physiology and anatomy of the same in their respective departments. In infectious or communicable diseases laboratory tests should be made to confirm the diagnosis, and this should be the rule and not merely done in exceptional cases of doubtful diagnosis. A larger use of the laboratories in case of non-infectious diseases is recommended, such as pathological and histological examination of diseased tissue, examination of secretions and excretions, urine, blood and milk analyses, etc.

G—Filing and Use of Case Reports.

Case reports should be filed for future use. Those of special significance or which are typical of certain diseases may be used in teaching those diseases and those which it is believed will be of value to clinicians and practitioners should be reported for publication.

We do not feel that this report should be concluded without repeating and thus emphasizing the importance of giving clinical diagnosis a larger place in our veterinary curriculum. To secure the best results, this course, like all others, must be dominated by a scientific system of presentation. We should ever be mindful of the old truism, "The treatment of a disease should not be given to a man who can not make the diagnosis."

GEO. H. GLOVER,
J. N. PRINGLE,
R. P. MARSTELLER,
Committee.

MINNESOTA STATE VETERINARY MEDICAL ASSOCIATION.

Following is the program of the twenty-first semi-annual meeting of the Minnesota State Veterinary Medical Association,

to be held in the Chamber of Commerce rooms, Brainerd, Minn., Wednesday and Thursday, July 9-10, 1919:

OFFICERS — 1919-1920.

President—Dr. C. A. Nelson, Brainerd.

First Vice President—Dr. H. A. Greaves, Glenwood.

Second Vice President—Dr. A. J. O'Hara, Northfield.

Secretary-Treasurer—Dr. C. P. Fitch, St. Paul.

Board of Trustees—C. A. Nelson, Brainerd; W. A. Anderson, Sleepy Eye; A. F. Lees, Red Wing; E. B. Carter, Austin; C. P. Fitch, St. Paul.

COMMITTEES — 1919-1920.

Colleges—H. C. H. Kernkamp, chairman; C. Cherry, H. G. McGinn.

Infectious Diseases—M. H. Reynolds, chairman; M. J. Sexton, M. S. Whitcomb.

Finance—G. E. Metger, chairman; E. H. Kartsrude, A. O. Rustad.

Legislation—R. J. Coffeen, chairman; A. F. Lees, W. L. Boyd.

Bacteriology—W. L. Beebe.

Surgery—W. C. Prouse, chairman; T. Lambrecht, W. C. Bromaghin.

Medicine—E. N. Schoen, chairman; H. A. Greaves, C. J. Sigmond.

Resolutions—M. R. Higbee, chairman; J. H. Elmer, J. N. Gould.

Salmon Fund—G. Ed. Leech, chairman; E. T. Frank, C. E. Cotton.

Stallion Registration—C. S. Shore, chairman; W. A. Anderson, C. A. Nelson.

WEDNESDAY.

Meeting of Board of Trustees at 9:30 a. m. in Chamber of Commerce rooms.

Meeting of the association called to order at 10:30 a. m. in Chamber of Commerce rooms by President C. A. Nelson.

ORDER OF BUSINESS.

Reading of the minutes of the last meeting.

Address of the President.

Secretary's report.

Treasurer's report.

COMMITTEE REPORTS.

Colleges—Dr. H. C. H. Kernkamp, chairman.
Infectious Diseases—Dr. M. H. Reynolds, chairman.
Finance—Dr. G. E. Metzger, chairman.
Legislation—Dr. R. J. Coffeen, chairman.
Bacteriology—Dr. W. L. Beebe, chairman.
Surgery—Dr. W. C. Prouse, chairman.
Medicine—Dr. E. N. Schoen, chairman.
Salmon Fund—Dr. G. Ed Leech, chairman.
Stallion Registration—Dr. C. S. Shore, chairman.
Resolutions—Dr. M. R. Higbee, chairman.
Report of Board of Trustees on applications for membership.
Election of new members.
Unfinished business.
Miscellaneous business.

Afternoon.

Meeting called to order.
Reading of papers:

The Practice of Obstetrics in Swine, Dr. J. N. Gould, Worthington.

The Control of Hog Cholera and Some Other Infectious Diseases of Swine, Dr. C. N. Hackett, Bureau of Animal Industry, South St. Paul.

Animal Husbandry and Veterinary Practice, Dr. C. W. Gay, University Farm.

Evening.

Address of Welcome—Mr. F. E. Little, Mayor of Brainerd.
Response—Dr. C. P. Fitch, University Farm.

Live Stock Sanitary Control Measures, Laws and Regulations, Dr. C. E. Cotton, Secretary Minnesota Live Stock Sanitary Board, St. Paul.

On July 1, 1919, the Federal Bureau of Animal Industry Regulation 7 will become effective. This regulation is to prevent the spread of tuberculosis in cattle and swine and control the interstate movement of all cattle. The tuberculin tests and health certificates of veterinarians in Minnesota whose competency and reliability are certified to by the Executive Officer of the Live Stock Sanitary Board, will be acceptable to the Bureau. The Bureau regulation for a proper tuberculin test and health certificate will be discussed and understood.

The last legislature passed a law relative to controlling and regulating the use of serum-virus treatment for hog cholera. The Live Stock Sanitary Board's interpretation of this law and rulings will be explained and a discussion invited.

After the program a smoker will be tendered the association by the Brainerd Chamber of Commerce.

THURSDAY.

Morning.

The work of the State Veterinary Examining Board, Mr. A. J. Tupa, Executive Secretary, St. Paul.

Case Reports; Sterility of Cattle, Dr. K. J. McKenzie, Northfield.

Retained Placenta, Dr. W. L. Boyd, University Farm.

Army Veterinary Service in France, Major D. B. Palmer, Minneapolis.

Afternoon.

An auto tour will be provided by the Brainerd Chamber of Commerce in order to visit some of the neighboring herds. On this trip Mr. W. A. McKerrow, Extension Live Stock Specialist, University Farm, will give a demonstration of the judging of live stock.

Adjournment.

On Wednesday evening a reception for the ladies is planned at the Ransford Hotel. A theater party for the ladies will be given at the Best Theater on Thursday afternoon.

Reservations for rooms should be made early, as a large crowd is expected. C. P. FITCH, Sec.-Treas.

TIPPECANOE (INDIANA) VETERINARY MEDICAL ASSOCIATION.

The most successful meeting ever held by the Tippecanoe Veterinary Medical Association took place June 5. Afternoon session at the Veterinary Building, Purdue University, where Dr. Cotton of the Bureau of Animal Industry, Washington, D. C., gave a splendid address on contagious abortion disease. A banquet was held at 6 o'clock at one of the local hotels in honor of the veterinarians who have returned from service. Dr. Roy B. Whitesell of Lafayette gave a resume of his experience on the battlefield. Dr. Whitesell was among the first veterinarians to go across after we entered the war.

Dr. R. F. Smith of Burrows also gave a brief review of his experience in France, Italy and a visit to Austria and Hungary after the armistice was signed. Dr. Smith had the pleasure of interviewing Drs. Hutyra and Marek while in Budapest. He was greatly impressed with the magnificent equipment of the Royal Veterinary College.

Following this, Professor G. L. Roberts of Purdue University, who was head of the educational reconstruction of the West Baden Hospital, gave a stereopticon lecture, pointing out the methods and systems adopted in fitting the unfortunate crippled soldiers to take up a new life work.

L. C. KIGIN,
Secretary and Treasurer.

NATIONAL ASSOCIATION OF BUREAU OF ANIMAL INDUSTRY VETERINARIANS.

Dr. J. A. Kiernan, chairman of our Committee on Legislation and Publicity, Washington, D. C., wired this office on the 4th inst. that the agricultural appropriation bill for the fiscal year beginning July 1, 1919, passed the House of Representatives on June 4, containing the Rainey amendment and the overtime pay provision as it passed the House in the sixty-fifth Congress, and that Congressman Rainey feels confident that the House action will be confirmed by the Senate.

The following is a copy of that section of the agricultural bill containing the above-mentioned legislation:

"MEAT INSPECTION, BUREAU OF ANIMAL INDUSTRY:

For additional expenses in carrying out the provisions of the meat-inspection act of June 30, 1906 (thirty-fourth statutes at large, page 674), there is hereby appropriated for the fiscal year ending June 30, 1920, the sum of $803,960; provided, that hereafter the Secretary of Agriculture is authorized, in his discretion, to pay employees of the Bureau of Animal Industry employed in establishments subject to the provisions of the meat-inspection act of June 30, 1906, for all overtime work performed at such establishments, at such rates as he may determine, and to accept from such establishments wherein such overtime work is performed reimbursement for any sums paid out by him for such overtime work."

This means that, if the House provision prevails in the Senate, funds will be available with which to grant basic (permanent)

salary increases of $120 each per annum to 2,932 employees in the meat inspection service who are now receiving basic salaries of $2,500 or less per annum. This increased appropriation will also permit of basic salary increases of $240 each per annum to 11 veterinary inspectors in the meat inspection division now receiving basic salaries in excess of $2,500 per annum.

The permanent salary increases that will be made possible through the Rainey amendment are in addition to the temporary bonus of $240 per annum provided for in Section 7 of the legislative, executive and judicial bill for the fiscal year 1920, which is quoted verbatim on pages 33 and 34 of the proceedings of our Philadelphia convention. You will note that those 11 veterinary inspectors who stand to receive a basic salary increase of $240 per annum through the Rainey funds are barred from any temporary salary increases through the legislative act.

It is my understanding that the agriculture bill for the fiscal year 1920, as passed by the House during the present Congress, also provides sufficient lump sum appropriations to permit veterinarians in branches of the Bureau service, other than meat inspection, to receive basic salary increases on about the same basis as herein specified for veterinarians in the meat inspection service. S. J. WALKLEY, Secretary.

Dr. William E. White is in charge of the Bureau coöperative hog cholera work in the state of South Carolina, with headquarters at Columbia. He is associated with the State Veterinarian, Dr. R. O. Feeley, who is also an official in the State College of Agriculture.

Dr. Charles E. Schneider has been placed in charge of federal meat inspection at Albert Lea, Minn., vice Dr. George W. Knorr, resigned to engage in outside business.

Drs. Solon Gillen, A. C. Curtiss, Jay B. Current, Jay W. Reeder, William C. Storch and Frank J. Lingo have been added to the force of inspectors at Columbus, Ohio, engaged in the eradication of tuberculosis.

The Louisiana State Board of Veterinary Medical Examiners met in Baton Rouge, Wednesday, June 11, and examined six applicants for license to practice veterinary medicine in Louisiana.

COMMUNICATIONS.

STOCKYARDS AGAIN OPEN TO PUBLIC.

To the Editor:

We are of the opinion your readers will be interested in the following and for that reason are sending it to you for your news columns. ARMOUR & Co.

After being closed for two years, due to government restrictions prohibiting visitors from the stockyards because of the war, Armour & Co.'s huge plant in the Chicago stockyards is again open to visitors.

This announcement will prove of interest to not only people who intend to visit Chicago some time this summer but to many others as well because, the announcement says, "preparations are being made by Armour & Co. to open their other plants in various parts of the country so that a trip through a packing plant, which is an educational one, will not just be limited to Chicagoans or visitors to Chicago, but to people in fifteen different parts of the United States, where Armour & Co. have packing plants. Uniformed guides are in attendance to explain the various interesting things to be seen."

ANTHRAX AND SERUM.

To the Editor:

The approach of the anthrax or charbon season naturally brings to mind our experience of former years, and in this connection, I recall most vividly my experience in the use of anti-anthrax serum as a curative agent during the season of 1918. We were using the serum from two of the principal biological houses as a curative agent, with very flattering results, using from one to two hundred cubic centimetres intravenously as an initial dose and following this up with either intravenous or subcutaneous doses, as the case seemed to indicate.

Along about August the supply of serum ran out, and after two or three weeks' continuous telegraphing we at last procured a new supply. We immediately resumed our treatment, as the infection at that time was very prevalent, but with absolutely negative results; in fact, losing over ninety per cent of the cases treated with the second supply of serum. Now, the question arises, what was the cause of this sudden change.

We know that the bacillus of anthrax is a microörganism of varying virulence, as proven by the fact of the manufacture of No. 1 and No. 2 viruses. It stands to reason that if the Bacillus anthracis may be cultivated in the laboratory of two such distinct strengths as we have in our No. 1 and No. 2 vaccine, then the same condition may, and in all probability does, obtain in nature. The conditions under which these bacilli grow must necessarily govern their virulence.

The question is, was there a sudden change from a low virulence in the spring, when we were having ninety per cent recoveries with the use of anti-anthrax serum, to a very high virulence in the fall, when we were having a ninety per cent loss with the same treatment, or was there a diminution in the potency in the second lot of anti-anthrax serum. We would be pleased to have some one answer this inquiry. F. J. DOUGLASS.

New Orleans, La.

ABOUT SECTION 7, CODE OF ETHICS.

Editor of the Journal:

Section 7, Article 19, of the by-laws of the Association, dealing with the Code of Ethics, is as follows: "It shall be deemed a violation of the Code of Ethics for any member of this Association to contract with or through the officers of any live stock insurance company for professional treatment of the members' stock so insured, but this rule shall not prevent any member from becoming an examiner of risks and acting in the capacity of an expert for same."

Come now the insurance companies with a contract amounting to an agreement in direct violation of the above code, but offering a fair and just remuneration for such services and demanding skillful and scientific work. If a large number of animals are insured this work will amount to considerable. On the other hand, if we refuse to sign up with them some nonmember will get it, with the result that it will amount to a loss of a part of our routine practice. What are we to do? The question is this: Is this part of the code fair to the members? If it is, then please will some one state why? If it is not, then why let it stand? As yet we do not know to what magnitude the live stock insurance business may grow.

However, it is well to be prepared so that if it should meet with more or less universal favor with the stock raiser and prove

a practical economy to him that we may not have to relinquish a part of our legitimate income to some other man just because the Code of Ethics of the Association of which we have the honor of being members tells us that we must.

G. E. JORGENSON,
Assistant State Veterinarian.

Clermont, Iowa.

Marechal Petain Decorating Major G. R. Powell with Legion d'Honneur.

Veterinary Corps,
A. E. F.

Editor of the Journal:

I am sending you a little snapshot of something that may be of interest to the readers of the Journal.

The picture is of the famous French general, Marechal Petain, decorating Major G. R. Powell, V. C., Assistant Chief Veterinarian, A. E. F., with the Legion d'Honneur.

Major Powell hails from Cleveland, Ohio, and I believe is the first American veterinary officer to be decorated with the Legion of Honor and the only one to be personally decorated by the famous Petain.

Yours truly,

WILLIAM D. ODOU,
Captain, V. C.

A HIGH COMPLIMENT TO THE B. A. I. AND TO THE VETERINARY PROFESSION.

Washington, D. C., May 29, 1919.

Dear Doctor Mohler:

I understand that the Bureau of Animal Industry is thirty-five years old today. The progress that the Bureau has made since its establishment is little short of marvelous. It is now, without a doubt, the most effective organization of its kind in the world, and I think it deserves the congratulations of the whole nation for the achievements to its credit. We all wish the Bureau many, many happy returns of the day.

Sincerely yours,

(Signed) F. R. HARRISON,
Assistant to the Secretary.

REGULATIONS FOR INSPECTION OF LIVE STOCK.

The regulations of the Secretary of Agriculture for the inspection and quarantine of horses, cattle, sheep, swine and other animals imported into the United States, issued under date of April 23, 1918, effective May 1, 1918, as amended, are hereby further amended by revoking regulation 39 thereof.

This amendment shall become and be effective on and after July 1, 1919.

Done in the District of Columbia this 17th day of May, 1919.

Witness my hand and the seal of the Department of Agriculture.

(Signed) D. F. HOUSTON,
(Seal) Secretary of Agriculture.

MISCELLANEOUS.

VACCINATING STOCKER AND FEEDER HOGS TO PROTECT COUNTRY'S SWINE INDUSTRY.

In an effort to protect the swine industry of the country against the possibility of introducing sick hogs into well herds, and at the same time to permit the shipment from stockyards of stocker and feeder hogs, the United States Department of Agriculture conducts a system of vaccination against cholera as a part of its inspection service at the various stockyards centers.

More than 324,000 hogs were immunized for shipment as stockers and feeders from stockyards of 18 cities during the six months from July to December, 1918, inclusive. To accomplish this without spreading disease in the face of all the attendant dangers, required such close care that the wisdom of some phases of the inspection system may not have been always apparent to all concerned. A description of the conditions under which stockers and feeder cattle are inspected is contained in a statement recently issued by the Bureau of Animal Industry of the department.

With swine moving by carloads and trainloads from producing areas into public stockyards of the country, says the statement, the pens of such yards are inevitably infected with the common swine diseases, of which cholera is the most important. Owing to this condition Federal regulations formerly required the slaughter of swine received, but after the serum and virus treatment against hog cholera was standardized, the possibility of reshipping immature hogs for further feeding resulted in a modification of the rules. Under the plan now in force swine properly vaccinated and disinfected may be reshipped for any purpose, including breeding.

PURPOSE AND METHODS OF INSPECTION.

Immunizing hogs against cholera is a veterinary procedure, including the preventive-serum treatment, taking of temperatures, and observing the condition of the animal during the test period. Necessarily the official regulations are of technical character, and it has come to the attention of the Department of Agriculture that in some cases the rules have been misinterpreted

so as to make them appear responsible for fluctuations in the stock-hog market.

For the information of the public, the Bureau of Animal Industry outlines briefly the method of inspection:

All public stockyards are considered to be infected and swine are, therefore, exposed to the contagion from the time of their entry into the yards; consequently, it is important that they be immunized promptly after arrival at such yards to protect them against contracting the disease.

For that reason the department opposes the immunization of swine that have been so exposed for more than five days. Hogs, though they may not show physical symptoms of cholera, may in some instances be affected with the disease to such an extent that immunization will not protect them.

VALUE OF FIVE-DAY LIMIT.

If the five-day limit were not applied many animals in this condition might be shipped to the feed lots, which would result in serious financial loss to the buyer through a high percentage of mortality, besides creating a center of infection in that community.

It is not permissible to immunize swine for immediate shipment interstate if they show symptoms of contagious or infectious disease.

If a considerable percentage of the animals in a lot is found to have high temperatures, the possible presence of such disease is indicated, and the animals are not immunized or permitted to be shipped interstate. It is possible to have hogs with high temperatures as a result of conditions surrounding the shipment to market, in which case they will return to normal within a short time.

In these instances the owner is permitted to present the animals for reëxamination as frequently as desired within the five-day limit, and if, upon such reëxamination, they are found to be normal their immunization is supervised, and after they are disinfected a certificate covering their interstate movement is issued. This provision is for the purpose of affording the owner every opportunity consistent with safety to the swine industry to market his shipment in the most profitable way.

MUST PROTECT PURCHASERS.

The practice of shipping swine from one public stockyard to another before immunization is liable to reduce the protection

afforded very considerably, because of the uncertainty as to the length of time the animals have been exposed. To permit the interstate movement of such lots would afford insufficient protection to the purchasers who are not familiar with these various phases.

Department inspectors, therefore, have instructions not to supervise the immunization of such lots unless it can be shown conclusively that not more than five days have elapsed since the animals were first unloaded in a public stockyard.

The widespread interest in the feeder and stocker trade is shown by the fact that the great majority of feeder hogs were sold in small lots. The figures for the Kansas City stockyards, where more than 100,000 hogs were immunized under Federal supervision during the last half of 1918, show that those animals were sold in about 600 different consignments, an average of approximately about 166 head per lot.

Briefly, it will be observed that the entire plan is to protect the swine industry against the introduction of sick hogs or those of doubtful health into well herds. Under the Federal regulations no hogs are held a longer time than is necessary to give them a clean bill of health.—*Weekly News Letter.*

PROTECTION AFFORDED OKLAHOMA HOGS FROM UNQUALIFIED VETERINARIANS.

To the Editor:—The following item from the Dallas (Texas) News illustrates a principle familiar to every member of the medical profession:

"Oklahoma City, Okla., May 27.—Complaints are being received by J. A. Whitehurst, president of the State Board of Agriculture, from graduate veterinarians that provisions of the 1916 statute relative to vaccinating hogs for cholera place an unnecessary burden upon the veterinarians in requiring examination and bond before they can apply the simultaneous serum and virus vaccination. Mr. Whitehurst applied to the attorney general for an opinion in the matter, and the reply is that, however severe the burden may be, there is no way to relieve it, and that the provisions of the law must be complied with. Laymen, veterinarians, physicians and all are placed in the same category, says the opinion of the attorney general. They must pass a satisfactory examination at the hands of the veterinary depart-

ment of the A. & M. College and put up a bond of $1,000 to be approved by the Board of Agriculture.''

In this state, as well as in many others, the chiropractor and the Christian Scientist do business without leave. They practice on human beings, no matter how serious the ailment may be. The osteopaths have to take an examination in their own peculiar theories, though they are allowed to apply these extraordinary theories in the treatment of any disease, chronic or acute. But the poor veterinarian has to qualify professionally and in addition put up a thousand dollar bond before he is allowed to dose the swine! It is said that the most convulsive type of humor is sometimes born of tragedy. S. H. LANDRUM,

Altus, Oklahoma.

Journ. Am. Med. Assn.

SUCCESSFUL MEETINGS OF INDIANA EXTENSION VETERINARIANS.

The second series of meetings for veterinarians in Indiana have been held in seven different sections of the state. Dr. W. E. Cotton, Assistant Superintendent of Experiment Station, Bethesda, Md., U. S. Department of Agriculture, Bureau of Animal Industry, gave a very interesting and instructive talk on contagious abortion disease at the various meetings. A lively discussion followed each address given by Dr. Cotton.

The attendance was unusually good, and the Indiana veterinarians feel deeply indebted to Dr. Cotton for the clear and concise way in which he presented his subject. The response to these meetings has been so gratifying that it is the intention of the extension department to continue to hold similar meetings from time to time in the future. L. C. KIGIN,

Extension Veterinarian.

Dr. Fenner C. Smith, formerly of Ithaca, N. Y., is now located at Sherman, N. Y.

Dr. Don A. Boardman has moved from Springville, N. Y., to Rome, N. Y., where he is now practicing.

After a residence of some time in Omaha, Neb., Dr. Charles H. Walker has moved to Idaho Falls, Idaho.